IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication JULY 14, 1960

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How to Establish Corporate Identity p. 71

Long-Range Employment Problems p. 61

An Appraisal of Tool Leasing p. 99

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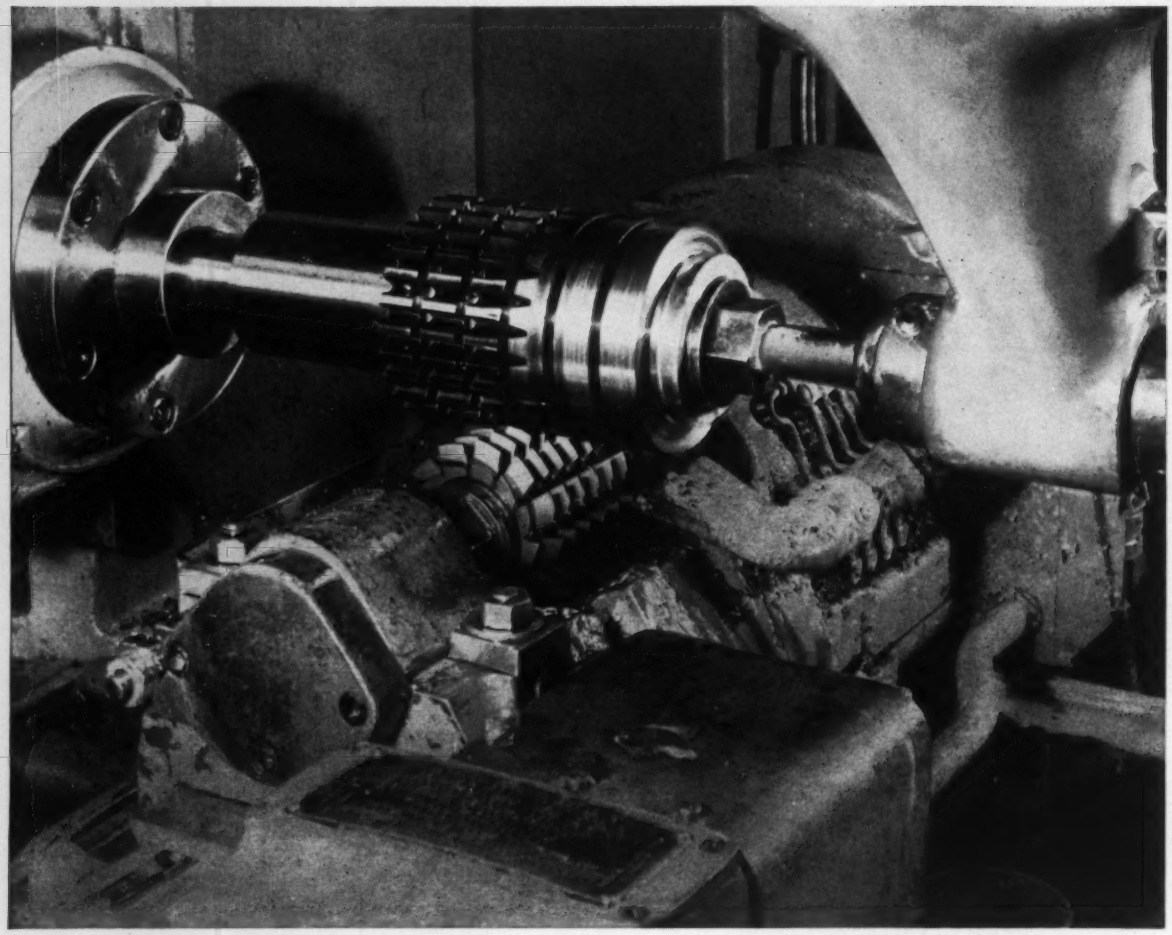

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COPPERWELD
STEEL COMPANY

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KNOW YOUR ALLOY STEELS . . .

This is one of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Annealing: Its Uses with Alloy Steels

Broadly speaking, the primary purpose of annealing is to soften steel and make it more workable. Annealing, as applied to alloy steels, may be defined as a process that heats above, and furnace-cools through, the critical range at a controlled, specified rate of speed; or that heats to a point within, and furnace-cools to a point below, the critical range. In either case, the choice depends upon the structure and maximum hardness desired.

The first method produces a lamellar pearlitic structure, while the second creates a spheroidized condition. These will be discussed separately in the following paragraphs:

(1) *Lamellar pearlitic structure.* It should be mentioned at once that this structure can be obtained both as described above and by a modified method known as isothermal annealing. In the isothermal process, the steel is heated above the critical temperature (austenitized), then transformed at a predetermined temperature, which depends upon the analysis. This operation requires two furnaces or salt baths —one for austenitizing, one for transformation.

Lamellar pearlitic structures are generally associated with machinability in carbon ranges from 0.20 to 0.60 pct, provided the hardness does not exceed the optimum maximum Brinell numeral. This is especially true where critical tooling is involved. It is a very versatile structure, as it gives best results in such operations as broaching, tapping, threading, deep drilling, boring, milling, and tooling as applied on single- and multiple-spindle bar automatic machines.

(2) *Spheroidized structure.* There are two general fields of use for this type of structure when alloy steels are employed. In the low and medium carbon ranges, spheroidization is necessary for cold-shaping operations, such as heading, extruding, drawing. In the higher carbon ranges (over 0.60 pct), it is mandatory where machining is involved, because it tends to lower the hardness of the steel.

If you want more details about these and other uses of annealing, and the results to be expected, by all means consult with our technical staff. And when you need alloy steels, Bethlehem can offer the full range of AISI standard grades, as well as special-analysis steels and all carbon grades.

This series of alloy steel advertisements is now available as a compact booklet, "Quick Facts about Alloy Steels." If you would like a free copy, please address your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

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Chestnut and 56th Sts.
Philadelphia 39, Pa., SH 8-2000

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THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Chilton," Philadelphia

The IRON AGE

July 14, 1960—Vol. 186, No. 2

Digest of the Week in

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News of the Industry

EMPLOYMENT PATTERN

Major Evolution? — Industry faces a number of employment and

unemployment problems. And they won't be solved overnight. It will take cooperation between labor and management. P. 61

DEFENSE SPENDING

Aerospace Up—Electronics and aerospace equipment producers gained additional government contracts during 1959. The list of the top 100 companies to benefit contains many familiar names. P. 63

STEEL EXPORTS

Top Imports—In May, steel exports topped imports for the first time in 17 months. If trend continues, this could be best year for exports since 1957. P. 64

WEST COAST

Coming Business Pattern—Consumer and government spending, plus capital equipment outlays are

Metalworking

Cover Feature

CORPORATE IDENTITY: Channing Wallace Gilson is a leading West Coast industrial designer. In this week's special report, he describes how a company can create a corporate image even through mergers and diversification. P. 71

keeping the Farwest economy strong. But some slowdown in activity is probable in early 1961. P. 81

MACHINING RESEARCH

Nuclear Aids Used — Machining research on space age metals can make good use of nuclear methods, report shows. Radioisotopes are successful in tool wear tests. P. 83

Engineering-Production Developments

MACHINE TOOL LEASING

An Answer to Financing?—To lease—or not to lease—is often the question. Leasing of machine tools has enjoyed a flood of publicity. As a result, it's often looked upon as a "cure-all" — with the ability to heal all financial ills. This isn't always true. Leasing should be regarded as just another tool which can benefit industry. P. 99

CERAMIC-SHELL MOLDS

Yield Heavy Castings — Investment castings meet a wide variety of uses. But size often presents a major problem. A ceremic - shell process eliminates this problem. This new process currently turns out complex castings that weigh up to 100 lb. P. 102

PLANNED PROFITS

With Ratio Analysis—It's tough to manage a successful business in this day and age. As competition shifts into fringe-expense areas, top management must become more scientific. Ratio systems provide the tools for big decisions. Formulas predict profits. P. 106

METAL HYDRIDES

Speed Sintering—No longer lab curosities, metal hydrides — particularly of zirconium and titanium— find wide use in industry. They readily absorb and evolve hydrogen. This plays a vital role in making foamed aluminum and in bonding ceramic or glass to metal. P. 108

DUAL-NICKEL PLATING

Improves Chromium Finish—Nickel plating is the basis behind good chromium finishes. A new process produces double nickel-plated layers that retard corrosion and add life to the chrome. P. 110

Market and Price Trends

AUTOMOTIVE

Second Best — In the first six months of 1960, automakers produced 3.8 million cars. This trailed only record 1955. A good fourth quarter could turn 1960 into the second best year ever for the industry. P. 75

WASHINGTON

Industry Unimpressed — The action of an election-year Congress has failed to impress industry. Some proposals, including construction bills, might get attention later this summer. P. 79

STEEL SUMMARY

Recovery Delayed—Setbacks of automotive steel orders have hurt the expected recovery of steel operations. Some tonnage ordered for August has been set back into September as automakers apparently are delaying their 1961 model production. In other steel markets, orders are slow for the rest of the summer. P. 133

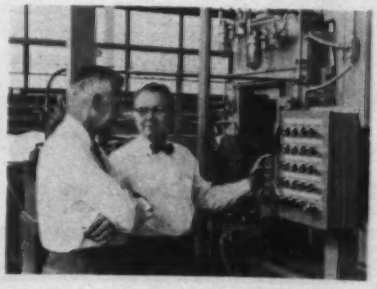
PURCHASING

The Record—Keeping a detailed record of purchases and use of materials helps Walter W. Parmer run an efficient purchasing department for John J. Nesbitt, Inc. P. 134

NEXT WEEK

AUTOMATIC DEFINNING

Speeds Heavy Castings—A new process automatically removes sprues and fins from engine blocks. It transfers a laborious, dirty job from human hands to a high-speed machine. This marks a major advance in foundry technology.



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This new booklet is crammed with information on Carmet Cemented Carbides . . . man's hardest, most abrasion resistant metal . . . and on design techniques that make the most of Carmet's unique properties.

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2008

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Additional pages of lists tell a further story of why you see

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on mills throughout the world.

Republic Steel Corporation
- 1—24" Billet Mill
- 3—21" Billet Mills
- 2—18" Billet Mills
- 1—19" Billet and Sheet Bar Mill
- 4—18" Billet and Sheet Bar Mills
- 1—16" and 14" Merchant Mill
- 1—11" Merchant Mill
- 3—12" Merchant Mills
- 1—10" Merchant Mill
- 1— 8" Merchant Mill
- 4—10" Roughing Mills
- 1—10" Skelp Mill
- 1—18" Sheet Bar Mill
- 1—35" Blooming and Billet Mill
- 1—10" Wire Rod Mill
- 1—10" Merchant and Rod Mill
- 1—14" Strip Mill
- 1—22½" Sheet Bar Mill
- 1—11" Merchant Mill

30 Mills

United States Steel Corporation
- 1—24" Billet Mill
- 1—18" Billet Mill
- 1—16" Billet Mill
- 2—14" Billet Mills
- 1—10" Hoop and Cotton Tie Mill
- 1—13" Merchant Mill
- 1—11" Merchant Mill
- 2—10" Merchant Mills
- 1—18" Sheet Bar Mill
- 1—10" Rod and Cotton Tie Mill
- 1—12" Roughing Mill
- 1—10" Merchant and Strip Mill

National Tube Division
- 1—18" Skelp Mill

American Steel and Wire Division
- 1—18" Billet Mill
- 1—13" Billet Mill
- 1—10" Strip Mill
- 3—10" Rod Mills
- 1— 9" Wire Rod Mill
- 1—4-Strand Rod Mill

Columbia-Geneva Steel Division
- 1—10" Rod Mill

Tennessee Coal & Iron Division
- 1—21" Billet and Sheet Bar Mill

25 Mills

Bethlehem Steel Company
- 1—30" Billet Mill
- 1—24" Billet Mill
- 1—18" Billet Mill
- 3—18" Billet and Sheet Bar Mills
- 2—12" Merchant Mills
- 3—10" Merchant Mills
- 1— 8" Merchant Mill
- 1—12" Skelp Mill
- 2—10" Wire Rod Mills
- 2—10" Wire Rod and Merchant Mills
- 1—10" Wire Rod Finishing Mill
- 1—Wire Rod Mill

19 Mills

Jones & Laughlin Steel Corp.
- 1—20" and 16" Billet Mill
- 1—21" Billet Mill
- 1—18" Billet Mill
- 1—21" and 18" Sheet Bar Mill
- 1—14" Merchant Mill
- 1—13" Merchant Mill
- 1—12" Merchant Mill
- 1—11" Merchant Mill
- 1—10" Merchant Mill
- 1—10" Skelp Mill
- 2—10" Wire Rod Mills

12 Mills

Youngstown Sheet & Tube Co.
- 1—24" and 18" Billet and Slab Mill
- 1—24" and 18" Billet Mill
- 1—14" and 18" Merchant Mill
- 1—12" Merchant Mill
- 1— 9" Merchant Mill
- 1—18" Sheet Bar Mill
- 1—21" Sheet Bar and Skelp Mill
- 2—10" Skelp Mills
- 1—10" Wire Rod Mill
- 1—10" Merchant and Rod Mill
- 1—21" Billet and Slab Mill

12 Mills

Armco Steel Corp.
Sheffield Steel Division
- 1—19" Sheet Bar Mill
- 1—12" Roughing Mill
- 1—18" Billet Mill
- 2—10" Rod and Merchant Mills
- 2—12" Merchant Mills
- 1—10" Rod Mill

8 Mills

MORGAN CONSTRUCTION COMPANY
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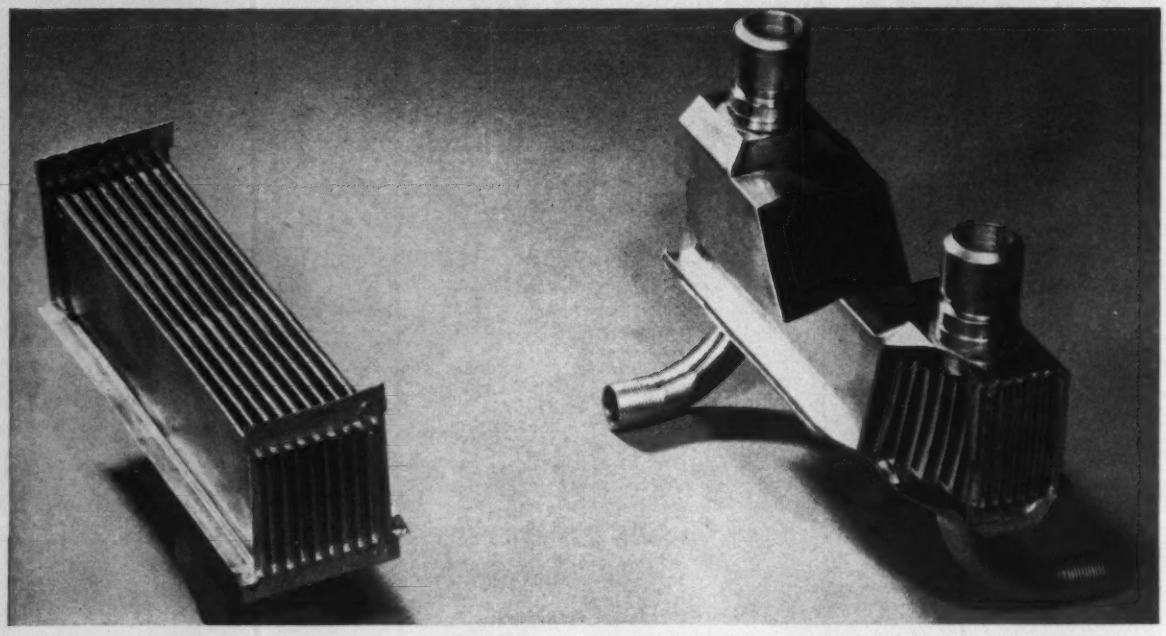
RM-84

Heat exchanger of Armco Stainless saves money, helps save lives



Blood and water are separated by the strong walls of the core (left) made from .005-inch Armco Stainless Steel. At right is a cut-away showing core in place in the case of Armco Stainless.

This tiny stainless heat exchanger made by the Surgical Instrument Company (Joseph A. Chyba and Sons), Baltimore, Maryland, protects human lives. During open-heart surgery, it cools the patient's blood to a point that surgeons consider safer. Even though it's used only once, it saves money compared with permanent types.

High tensile strength of Armco 18-8 Stainless Steel permits use of .005-inch thick core walls. These thin-gage stainless walls make the unit more efficient. In addition, Armco Stainless for case and tubes results in a unit that can be guaranteed sterile and pyrogen-free, and won't corrode in storage.

LOW IN COST

This unit costs less than a half-pint of blood, about $\frac{1}{20}$th as much as the cheapest of non-disposable units. It weighs only 7 ounces, compared to about 25 pounds for a permanent type. Moreover, the larger units take about a pint of blood to prime them and require thorough cleaning after use. This disposable unit can be used once, then thrown away at a saving for blood alone.

As in this unique heat exchanger, Armco Stainless Steels—sheets, strip, bars and wire—in more than 60 analyses and a broad range of gages, sizes, finishes and conditions, offer specific opportunities for savings and improved performance in thousands of products. Perhaps yours is one of them. Just mail the coupon for complete information.

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Our Next President: Lord Have Mercy on Him

Soon we will elect a new President. He will take from President Eisenhower the awful responsibilities of leading our nation. Never has a task been so formidable.

Our new President will need far more than the help of a few dedicated citizens. The election ballyhoo, the fiddle-faddle of politics, and the superciliousness of some voters are, this year, beside the point.

George Washington and Abraham Lincoln had their great problems. But it is not amiss to say that our next President will have more devastating and soul-searching decisions to make—mainly on his judgment alone.

The man we put in the White House must be tough, kind, humble and patient. Yet he must act like a leader and be a leader.

This man must have charity with strength and intelligence without arrogance. He must have maturity that knows no age. Above all, he must be expendable for his country.

We citizens have sadly neglected our duty to be informed. We have left to our leaders the job of coping with events, people, and potential catastrophes. Now we must make an attempt to open our eyes and our ears and to use our intellect when we choose and support our next President.

It may be too much to expect that all of a sudden we will take the intense responsibility for our nation which our forefathers took. Yet many of us will move in that direction. But real leaders walk alone. They receive little solace or help from those who appoint them.

That will be the lot of our new President. He will be the people, lead the people, and reflect the stamina and the leadership of the United States. Congress can't and won't do this. The people won't and can't do it and the politicians are too busy elsewhere.

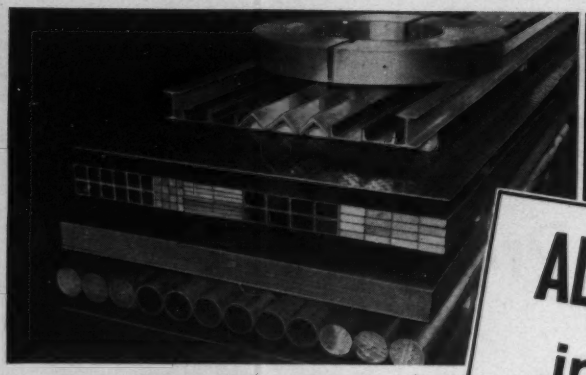
Our man must ponder the cold war. He must do the right thing for Latin American relations. He must size up and be prepared for the explosive power of the Red Chinese. He must balance threats with strength. Yet he must sense to his very bones his responsibility. He must face annihilation and set the price for freedom.

Of course he needs all of us. He needs Congress. He must have the characteristics of loyalty, integrity and dedication.

But because he will be alone, he needs God's mercy more than any other grace.

Tom Campbell

Editor-in-Chief



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Extruded Architectural Shapes
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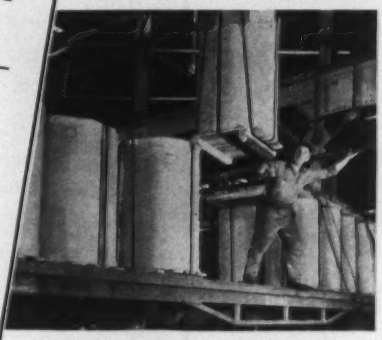
eliminates scrap. We can produce exact lengths and widths from coil stock for most users—usually on a net-weight basis.



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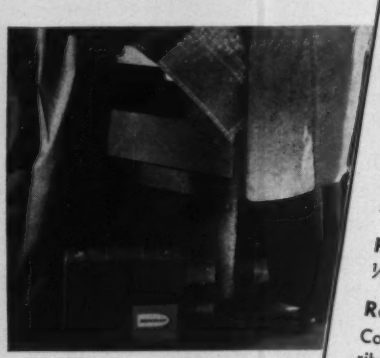

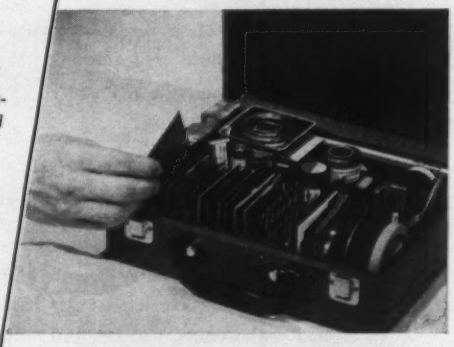

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Study Galvanize Welding

A research project aimed at making a low cost process for production-line spot welding was started by the Budd Co., Philadelphia. Attention is focused on usage by the automakers. Here galvanized steel welded into unitized bodies is fast becoming an important basis of current auto design. If successful, a hundred thousand ton market could exist.

Tungsten Plating at 300°C

High-purity tungsten can now be easily plated on metal surfaces by using a vapor deposition process. The method involves reducing gaseous tungsten hexafluoride with hydrogen by passing it over the heated object to be plated. At temperatures above 300° C, tungsten is deposited on the hot surface. The process also lends itself to the fabrication of tungsten articles of many complicated shapes.

Continuous Casting Plant

A new four-strand continuous casting plant will soon be built at Appleby-Frondingham Steel Co., England. Equipped to cast four strands of 9-in. square blooms, the machine will be designed to operate from 100-ton ladles of steel. It will have a weekly productive capacity of 5000 tons. Operations are set to begin late 1961.

More Vacuum Melting

Vacuum melting is quietly expanding its commercial markets and may be ready for a big jump in this direction. According to one producer, 25 pct of vacuum melted steels are now going to commercial use. Steam turbines for power generators will soon provide a major new market.

Self-Coating Ceramic

Ceramic graphite-base material spontaneously forms its own protective coating against heat and oxidation. A typical mixture consists by weight of 50 pct graphite, 24 pct molybdenum disilicide and 25 pct titanium boride with minor bonding agents. The protective layer, about 0.001 in. thick forms at 2,000°. As temperature and exposure to oxidation increase, the layer thickens and becomes even more resistant.

Weldable Die Castings

A new horizon opened for aluminum die casting. A new alloy contains the necessary high strength, and also adds many other good points such as the ability to be welded, brazed and color anodized. These can all be done, on a production basis. Many manufacturers have already shown interest in its lighter weights and decorative end use.

New Rubber Stretches Life

A new urethane rubber extends the life of feed rolls. The rubber coated rolls are used to feed 5/32 in. strands of plastic material in cutting operations. The new Adiprene urethane rubber held up over 225 days of use and still shows no sign of wear. Other materials lasted only 28 days.

Produces More Footage

X-ray gages provide automatic thickness measurements and controls for aluminum-foil mills. These mills operate at speeds up to 2,000 fpm. The gages double as non-contact micrometers and automatic controllers. As a result, the mills produce more square feet of surface area per pound of metal used—while still holding commercial thickness tolerances.

Tooling To Demands

One of the trends in machine tools that may escape many observers until the fall is the counterpart of the compact car—or economy model. More and more, companies are readying stripped-down machine tools to meet foreign competition. Simplified design and new materials are other features. Look for more machines following these trends, especially in the large "elephant" categories.

The old elevated rail-cars were a bottleneck at this big Eastern steel mill. Besides, using this manually operated ore dumping system, it was costing too much to move material to the various stockpiles. A conveyor belt looked like the answer, and on the recommendation of the G.T.M.—Goodyear Technical Man—the new system was equipped with a rugged 48-inch Style B Belt. It's muscled with heavy, multi-ply fabric for just such demanding duty. And the result? Operating with a traveling stacker, the G.T.M.'s belt handles the materials at 600 t.p.h. on an average—up to 1,000 t.p.h. when pressed. Moneysavings over the first 5 years? Mill management figures them at better than $50 per operating hour—a 15% cut in cost over previous stockpiling methods.

The G.T.M. is the man with a knack for ferreting out possible economies—wherever industrial rubber products can do the job.

Why not cash in on this moneysaving talent—simply by contacting him through your Goodyear Distributor. Your distributor's also the man to see for unbeatable V-Belts, Hose and other products. You'll find him under "Rubber Goods" or "Rubber Products" in the Yellow Pages. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

Lots of good things come from

GOODYEAR

THE GREATEST NAME IN RUBBER

FATIGUE CRACKS

About an Author

We were intrigued by an item in the biography of this week's cover author, industrial designer Channing Gilson.

On his 18th birthday, he enlisted in the U. S. Army. While stationed in Hawaii, he entered a competition for a West Point appointment and made it. He graduated from the academy and went into the Air Force.

Post War—After World War II service and in the occupation of Okinawa and Japan, he resigned in 1948, studied industrial design, and apprenticed in the office of Henry Dreyfuss, noted industrial designer.

The transition from Army officer to industrial designer is the point that intrigued us. Our West Coast editor, Ray Kay, (see picture) was ahead of us and had already posed the question.

The Great Love — Mr. Gilson told our editor that he always had a great love for the constructive, rather than the destructive. So, after the war, back to school.

We suggest you turn to p. 71 and read Mr. Gilson's analysis of establishing and maintaining corporate identity ("image," if you prefer) throughout a period of transition, diversification and expansion.

Farewell, Dark Ages

Philadelphia subway riders have been complaining for years about the archaic "cattle cars" that transported them about the city. Last week they were all smiles.

Streamlining down the tracks were new, stainless steel cars (see p. 67) that offer the utmost in comfort and design. Built by Philadelphia's Budd Co., the cars mean faster service and should eliminate all grumpy faces.

Welcome Ride—We went along on the inaugural run and to us (strap hangers almost every day) it was a more than welcome ride. These new cars should even make getting to the office more inviting in the early hours.

But perhaps the best comment on the big changeover was made by Philadelphia Mayor Richardson Dilworth. "It means an end to the Dark Ages."

WHO? RAY! IRON AGE West Coast editor Ray Kay, right, talks with industrial designer Channing Gilson about corporate identity. To see what Mr. Gilson has to say on this subject turn to p. 71.

FURNACES
TO HEAT TREAT OR SHAPE METALS MORE EFFICIENTLY
CAR HEARTH FURNACES
ROTARY HEARTH FURNACES
PIT-TYPE FURNACES
HI-HEAD FURNACES
BELT TYPE FURNACES
CHAIN CONVEYOR FURNACES
Write for technical data and catalogs on the above and many other R-S Furnaces to . . .
R-S FURNACE COMPANY, INC.
North Wales, Pa.
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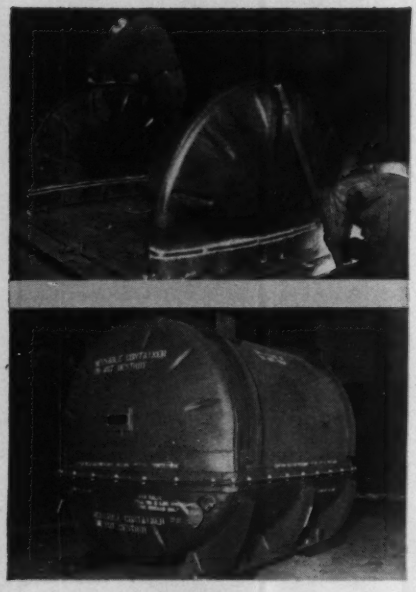
FURNACES

COMMERCIAL heads up "engine packs"



SMOOTH, ACCURATE FLANGE of COMMERCIAL heads is used as fitting up template and welding fixture in applying shell wrapper. Note embossed ribs giving heads added strength.

COMMERCIAL tank heads are important components of reusable containers fabricated by the New Castle Welding & Mfg. Co. of New Castle, Pa. for storage and shipment of army tank engines.

Built-in "bench marks"— Since containers are pressurized, humidity-controlled, and rugged enough to survive 5-foot free fall with motor weighing 3700 lb. mounted inside, it was imperative for tank heads to fit snugly—integrate smoothly. In fact, the precision uniformity of the flanges of COMMERCIAL heads serve as gauges for fitting the wrapper sheet, speed assembly, make welding easier and faster.

Head details— Engine container heads were custom-made (60" long diameter, 11 gauge QQ-S-640 steel, 1½" straight flange) by COMMERCIAL to rigid specs. COMMERCIAL engineers also designed the embossed ribs on the heads for greater impact resistance. With over 30 years experience and ingenuity in cold forming of steel, COMMERCIAL produces heads with improved metal quality in presses up to 2000-ton capacity. Three plants—Youngstown, Chicago, Salt Lake City—strategically located in important steel producing centers, are keyed to expedite your order.

For fast delivery—COMMERCIAL offers standard heads from stock made with a complete range of solid dies in all standard sizes from 12" to 72" O.D., in all popular gauges up to ½" thickness. Heads can be furnished for code or non-code pressure vessel construction from steels to meet the required specifications. Types furnished include flanged and dished, ellipsoidal, hemispherical, flanged only, double dished and obround. For full information on heads in stock for immediate delivery, write to Commercial Shearing & Stamping Company, Dept. K-29, Youngstown 1, Ohio.

Specialists in the shape of things to come

COMMERCIAL
shearing & stamping

LETTERS FROM READERS

Normal Year?

Sir—We read much about what has happened to the soaring 60's, but the cause seems to have escaped most people. There should be new traffic signs reading: 1960 Traffic Slow, People Catching Up.

Big factories, with bigger capacities and automated to meet competition, are in existence everywhere. Sales promotions have people buying on time almost anything with payments extended up to 30 years.

There comes a time when payments take almost all of the take-home pay, and then this happens: Combined high capacity, automation, and high wages cause overproduction. Then high prices bring on foreign goods. This results in almost no overtime pay, amounting to from $40 to $75 per month per employee. People lived on the total take-home pay and suddenly receive less and must cut back.

Only Bare Needs—As payments must be met, a real readjustment has to be made. Therefore few, if any, new purchases are made above the need for bare essentials.

I have no fear of a depression and believe this year will be a good year if we still remember what a good year is. Since 1942, normal has been found only in the dictionary.

All people, especially politicians and union leaders, should strive for things good for the country and not votes or dues paying members.

Feather bedding is just as flagrant in government as anywhere else. Government control and providing only adds to cost, and people should be doing more at the grass roots level for local needs.—L. H. Schaut, St. Marys, Penna.

Special Interest

Sir—An article on Value Engineering appeared in your 12 May 1960 issue of IRON AGE written by L. J. Marcon. This article is very enlightening and has special interest to the Value Engineering Group from the Philadelphia Naval Shipyard.

It would be appreciated if you can furnish a copy of this article for use in our office and the Design Division of this Shipyard.—Edward A. Foehl, Philadelphia.

▪ **As requested, copy is in the mail.—Ed.**

A Request

Sir—This is to request your permission to reprint the article by Tom Campbell which appeared in the June 2, 1960, issue of The IRON AGE, entitled "A New Look at Steel Problems."

Our club, which consists of 1659 members of management from the industries and businesses of central Ohio, is an educational organization. As a part of our program we publish a monthly paper entitled "Supervisory Notes" in which we reprint material of general interest, such as Mr. Campbell's article.

A considerable number of the courses included in our program deal with communication, and we feel that the article, particularly the "Group Attitudes — Corporation Summary," will be helpful in an improvement of the abilities of our members to express themselves in a language which will be interpreted as intended.

The emphasis on the importance of well informed and trained foremen actively working in the field of attitudes 365 days a year is also one of the important observations which makes us seek permission to reprint this article.

We hope that you will be able to grant us the privilege of publishing this excerpt from your publication in an early issue of our "Notes."—T. O. Jenney, The Foremen's Club of Columbus, Inc., Columbus, O.

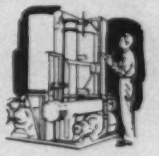
▪ **Permission Granted.—Ed.**

DICK ELLIOTT
Hayes Sales Engineer
and General Sales Manager
personally invites you to

"SOLVE YOUR HEAT TREAT PROBLEM IN OUR LAB"

Ever since 1918, C. I. Hayes has maintained a laboratory of the latest *production-line* furnaces and allied equipment (not lab models) on which actual heat treating processes can be duplicated and evaluated. Here you can take an active part in developing the best heat treat procedure for your needs. You participate in developing equipment that's exactly right for your work.

CUSTOMERS ARE WELCOME to make use of the lab without cost or obligation. Hayes equipment *plus* our engineering know-how *plus* the Hayes library of case histories — this combination is ready to help you solve your problems . . . either with standard or special furnaces.



HAYES SHOWED THE WAY— others followed. There are several "Chinese copies" of the Hayes lab in industry today . . . proof positive that the right way to solve heat treat problems is the Hayes way — by experimentation and demonstration — not by "sweet talk".

WANT RESULTS GUARANTEED? Won't you please take advantage of our lab and its range of furnaces and atmosphere generators . . . whether you're hardening low carbon steel, sintering refractory metals, or brazing stainless. Let us show you how to improve your product, reduce costs, and speed production.

BULLETIN 1961 gives full lab details . . . write for your copy today.

C. I. HAYES, INC.
Established 1905
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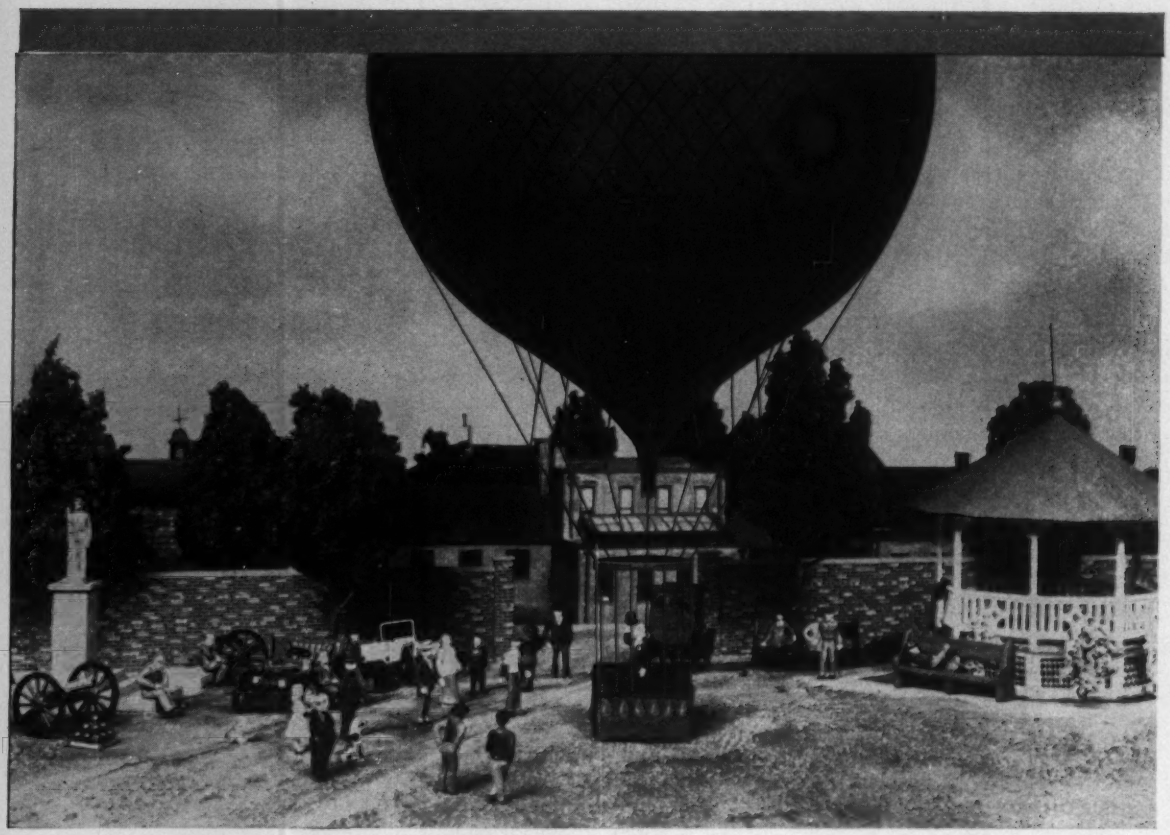
It pays to see HAYES for metallurgical guidance, lab. facilities, furnaces, atmos. generators, gas and fluid dryers.

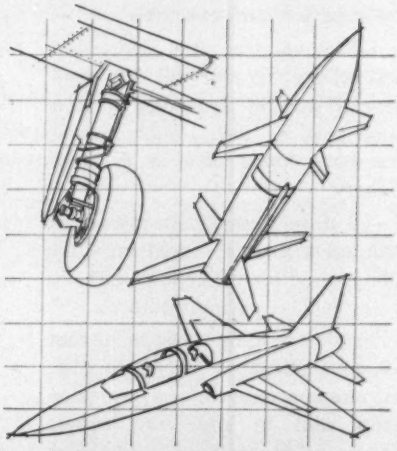


Are you up in the air over tubing sources?

If you have ballooning production problems, consider these important facts. OSTUCO Tubing is always the exact tubing you need for your product because OSTUCO Tubing is CUSTOM MADE for your product. Your order is manufactured to your own specifications to produce steel tubing especially for your application — the precise grade, analysis, size, shape, special anneal and tolerances best suited to your needs.

Ohio Seamless Tube produces both seamless and electric welded steel tubing — is prepared to form many finished or semi-finished tubular parts to your designs.

To get the most from your next steel tubing order, use Custom Made OSTUCO Tubing. Contact your nearest Ohio Seamless representative, or send part drawings to the plant at Shelby, Ohio — Birthplace of the Seamless Steel Tube Industry in America.



A-2449A

Model illustrated built to 3.5 mm scale.

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OHIO SEAMLESS TUBE

Division of Copperweld Steel Company • SHELBY, OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

SALES OFFICES: Birmingham, Charlotte, Chicago (Oak Park), Cleveland, Dayton, Denver, Detroit (Huntington Woods), Houston, Kansas City, Los Angeles (Lynwood), Miami, Moline, New York, New Orleans (Chalmette), Philadelphia (Wynnewood), Pittsburgh, Richmond, Rochester, St. Louis, St. Paul, Salt Lake City, Seattle, Tulsa, Wichita

CANADA: Railway & Power Engr. Corp., Ltd. • EXPORT: Copperweld Steel International Company, 225 Broadway, New York 7, New York

COMING EXHIBITS

Machine Tool Exposition—Sept. 6-16, International Amphitheatre, Chicago. (National Machine Tool Builders Assn., 2139 Wisconsin Ave., Washington 7, D. C.)

Production Engineering Show — Sept. 6-16, Navy Pier, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Coliseum Machinery Show — Sept. 7-15, Chicago. (Contact: A. B. Perkins, 2216 South Hill St. Los Angeles 7, Calif.)

Iron & Steel Show — Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

Metal Show—Oct. 17-21, Convention Hall, Philadelphia. (American Society for Metals, Metals Park, Novelty, O.)

Die Casting Exposition & Congress—Nov. 8-11, Detroit Artillery Armory, Detroit. (The Society of Die Casting Engineers, 19382 James Couzens Highway, Detroit 35.)

MEETINGS

JULY

Metal Lath Mfrs., Assn.—Summer meeting, July 20-21, Carlton House, Pittsburgh. Association headquarters, Engineers Bldg., Cleveland.

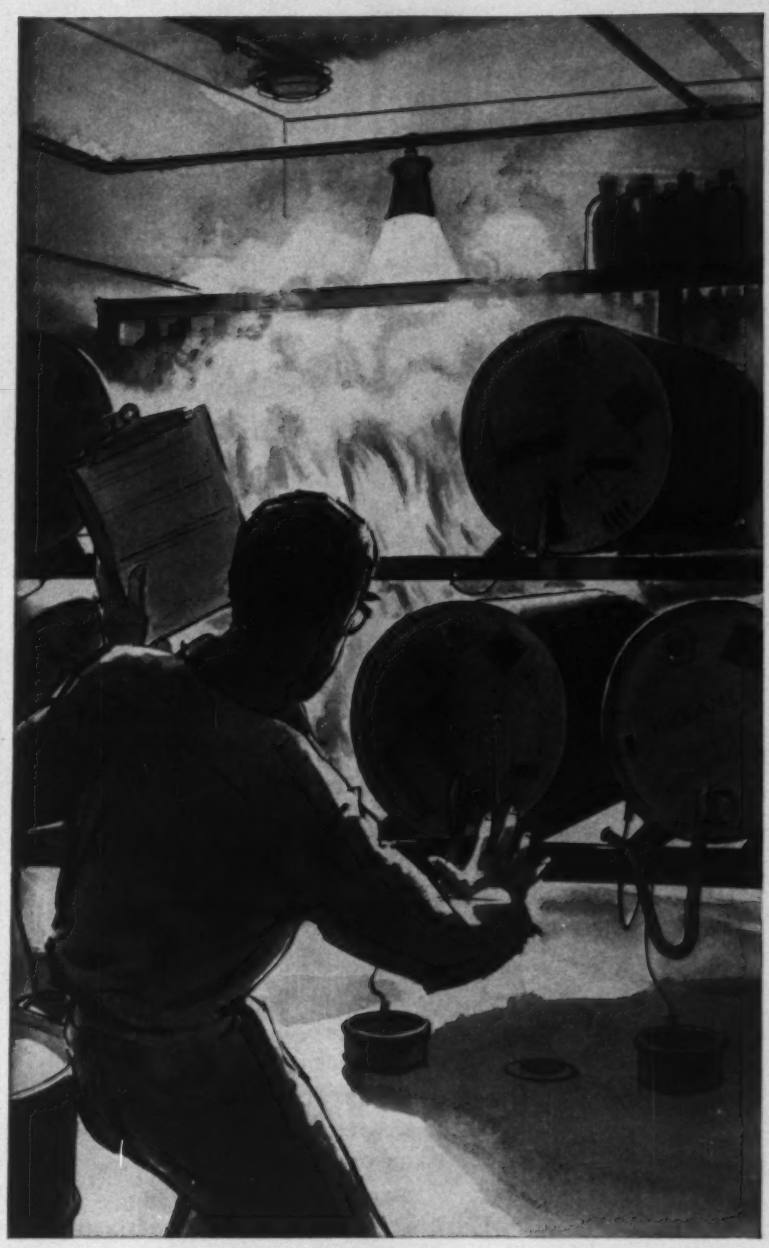
American Electroplaters' Society—Annual convention, July 24-28, Statler Hotel, Los Angeles. Society headquarters, 445 Broad St., Newark, N. J.

SEPTEMBER

American Machine Tool Distributors Assn.—Annual meeting, Sept. 3-4, LaSalle Hotel, Chicago. Association headquarters, 1500 Massachusetts Ave., N. W. Washington 5, D. C.

Assn. of Lift Truck & Portable Elevator Mfrs.—Fall meeting, Sept. 12, The Cavalier Club, Virginia Beach, Va. Association headquar-

(Continued on P. 16)



Knockout punch! In seconds, fire can have your business on the ropes. Keep your guard up by protecting storage rooms for volatile solvents, gases, flammable liquids with a *fully-automatic* Kidde carbon dioxide extinguishing system. U.L. and F.M.-approved Kidde systems actuate at the first flash of fire, smother it in seconds, leave no mess, turn off power and sound an alarm. Kidde's 35 years' experience can help you protect *any* hazard. Write today and find out how.

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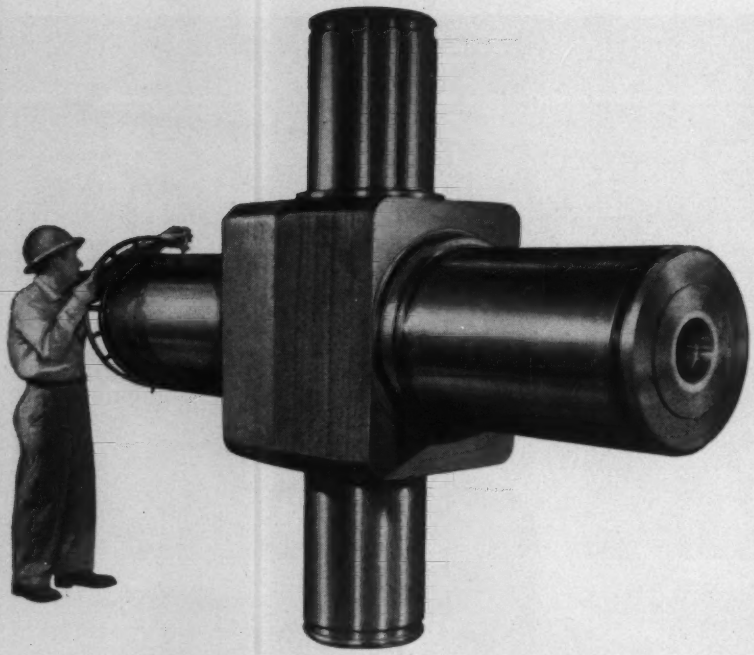

13½ TON EQUALIZING AXLE from BLUEPRINT to FINISHED PART by FINKL

This 27,000 pound steel forging,* made to support a million pound load, was completely manufactured from molten steel to a finished machined part in the Finkl shops.

A 115,000 pound electric furnace steel ingot was cast, forged, hot cut and heat treated, followed by hundreds of hours of rough and finished machining. Then the square section was heated to accept the horizontal part to complete the shrinking operation to make this equalizing axle.

Finkl is well-equipped to engineer and produce a wide range of forged parts . . . our sales engineers will be pleased to talk to you about your forgings, hot work steels and die block needs.

*Replaced a casting

HOT WORK STEELS · DIE BLOCKS · FORGINGS · ELECTRIC FURNACE STEELS

Manufacturers of the
largest forgings in the Middle West

A. Finkl & Sons Co.

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MEETINGS

(Continued from P. 15)

ters, One Gateway Center, Pittsburgh 22, Pa.

Electronic Industries Assn. — Fall conference, Sept. 13-16, French Lick-Sheraton, French Lick, Ind. Association headquarters, 1721 De-Sales St., N. W. Washington, D. C.

American Die Casting Institute — Annual meeting, Sept. 14-16, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

National Foundry Assn. — Annual meeting, Sept. 22-23, Edgewater Beach Hotel, Chicago. Association headquarters, 53 W. Jackson Blvd., Chicago.

Porcelain Enamel Institute, Inc.— Annual meeting, Sept. 25-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington, D. C.

Farm Equipment Institute—Annual convention, Sept. 25-28, The Statler Hilton Hotel, Dallas, Tex. Institute headquarters, 608 S. Dearborn St., Chicago.

American Welding Society — Fall meeting, Sept. 26-30, Pittsburgh. Society headquarters, 33 West 39th St., New York.

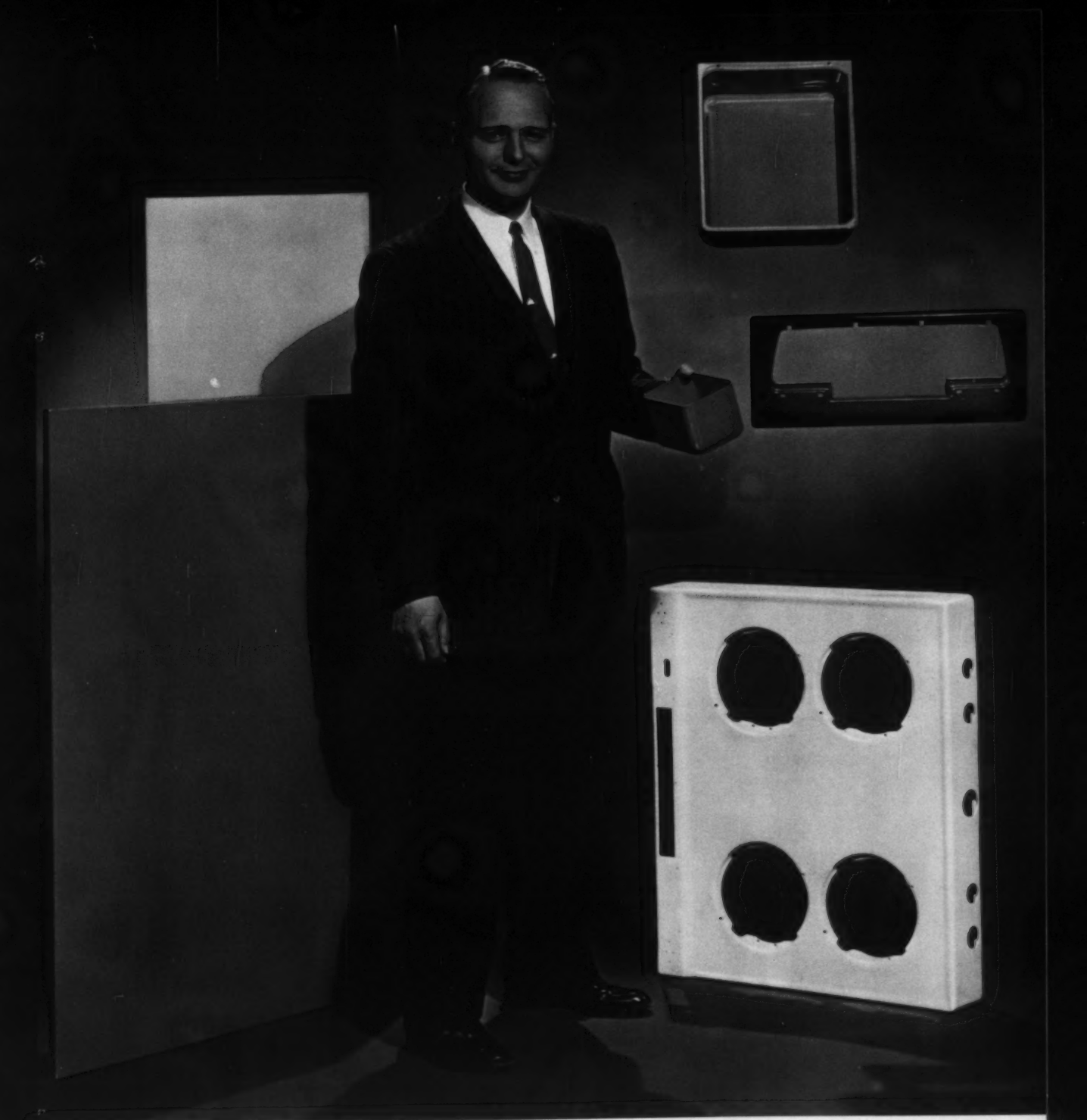
OCTOBER

Metal Lath Mfrs. Assn.—Fall meeting, Oct. 6-7, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, Engineers Bldg., Cleveland.

The Electrochemical Society, Inc. —Fall national meeting, Oct. 9-13, Shamrock Hotel, Houston, Tex. Society headquarters, 1860 Broadway, New York.

American Gas Assn.—Annual convention, Oct. 10-12, Atlantic City. Association headquarters, 420 Lexington Ave., New York.

Pressed Metal Institute — Annual meeting, Oct. 10-14, Shawnee Inn, Shawnee-On-Delaware, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.



BETHNAMEL

*a brand **NEW** kind of **STEEL SHEET***
for porcelain enameling

BETHLEHEM STEEL

NEW BETHNAMEL

...superb results at low costs

...for either two-coat or direct-on porcelain enameling

BETHLEHEM STEEL

Here is a totally new kind of steel sheet which provides a really outstanding enameling job, not only in the standard two-coat process but for single, "direct-on" cover coating too.

Developed by Bethlehem research engineers, Bethnamel is produced by an entirely new method. This new sheet has the amazingly low carbon content of about .003 pct, barely 1/10th that of ordinary enameling iron. Other elements are properly balanced to maintain superb enameling properties, and provide good sag resistance, drawability, and weldability, as well.

Single-Coat with Minor Changes in Cycle

With Bethnamel, boiling and fish-scaling are no problem, making this remarkable new sheet far superior to other enameling materials in the direct-on cover coat process. Simple, inexpensive modifications of existing two-coat pre-treatments are all that are needed to assure excellent adherence and rich appearance of the enamel.

Direct-on Method Cuts Costs

Bethnamel costs no more than conventional enameling iron. Thus enamelers can save on processing without adding to base metal costs. Bethlehem engineers are anxious to help you get started with this superior enameling sheet. If you're interested, by all means let our nearest sales office give you full details.

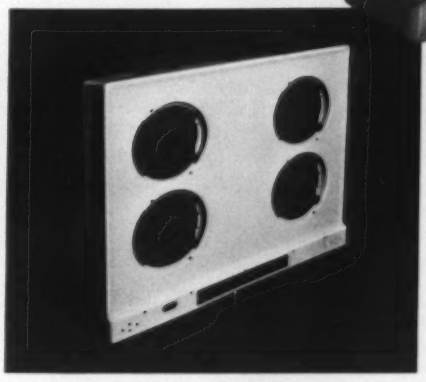
RANGE TOPS DEEP-DRAWN at Caloric Appliance Corp., Topton, Pa., are unusually tough draws, because of the relatively sharp corners. Bethnamel sheets take this severe drawing beautifully, prior to enameling.

GAY PORCELAIN-ENAMELED PANELS on this school speak for the rapid growth of colorful curtain wall construction. Bethnamel sheets have proved ideal for these applications, due to high sag resistance and excellent enameling properties.

BETHLEHEM ENGINEERS WILL

BETHNAMEL EASY TO DEEP-DRAW

Drawing-quality Bethnamel sheets can be deep-drawn with superior results, as shown in this group of tough-to-make porcelain-enameled articles. No splits or cracks here!



SUPERIOR SAG RESISTANCE

These 20-ga samples of Bethnamel (A), enameling iron (B), and cold-rolled steel (C), demonstrate that Bethnamel's sag resistance is better than that of enameling iron, and far superior to cold-rolled sheet steel, at firing temperatures of 1600 degrees.

ENAMEL THAT REALLY STAYS ON

In this torsion test, a simple angle of direct-coated Bethnamel was twisted 180 degrees without damage to the enamel. Because its thickness is only 3 to 4 mils, compared to 6 to 8 mils or more for 2 coats, a direct-on enamel can withstand much rougher handling!

TYPICAL MECHANICAL PROPERTIES
20-Gage Bethnamel Sheet

	Yield Strength (psi)	Tensile Strength (psi)	Total Elongation	Rockwell B	Olsen Cup Test (inches)
Longitudinal	26,000	43,000	38 pct	43	0.425
Transverse	28,000	44,000	40 pct		

HELP YOU WITH YOUR STEELWORKING PROBLEMS

BETHLEHEM STEEL

NEW BETHNAMEL
lights up like a lamp!

Now sheet-steel-and-ceramic panels can light up a room without bulbs, tubes, filaments, or cathodes! Called Panelescent® Lighting, this revolutionary "area" source of light is a development of Sylvania Lighting Products. A whole ceiling can become one huge lamp, or specific portions of an area can be lighted up, as in the automobile instrument panels shown here.

New Bethnamel sheet steel is proving to be a very practical base metal for Panelescent® applications. Sylvania is just one of many companies which are growing increasingly enthusiastic about Bethnamel. The future looks bright, both for Bethnamel and the porcelain enameling industry!

"Panelescent®" is Sylvania's registered trade name for electroluminescence

Steel
is strong, ductile, versatile... AND BETHLEHEM MAKES IT IN NEARLY EVERY FORM

Here's a partial list of steels and specialty products in the Bethlehem line:

BARS AND BILLETS:
Carbon and alloy AISI grades
Concrete reinforcing bars
Leaded steels
Special rolled sections

TOOL STEELS:
Water, oil, and air-hardening grades

ROD AND WIRE:
General and special-purpose types
Fine and shaped wire

FORGINGS:
Drop, press, hammer, and upsetter
Rolled-and-forged sections

SHEETS:
Hot- and cold-rolled
Continuously galvanized
Enameling sheets

TIN MILL PRODUCTS:
Electrolytic and hot-dip tinplate; blackplate

PLATES:
Universal and sheared
Flanged and dished heads

FASTENERS:
Bolts, cap screws, rivets
Special fasteners

STEEL PIPE:
Continuous butt-weld
Electric resistance-weld

STRUCTURAL SHAPES

COLD-FORMED SHAPES

PALLET RACKS

WELDMENTS:
Frames, tanks, housings, vessels

FREIGHT CARS, PARTS, WHEELS, AXLES

WIRE ROPE AND SLINGS

RAILS:
Tee, crane, girder

CASTINGS:
Carbon, alloy, and stainless steel
Iron, brass, bronze

Room 1041,
Bethlehem Steel Company, Bethlehem, Pa. M10

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BETHLEHEM STEEL

BETHLEHEM STEEL

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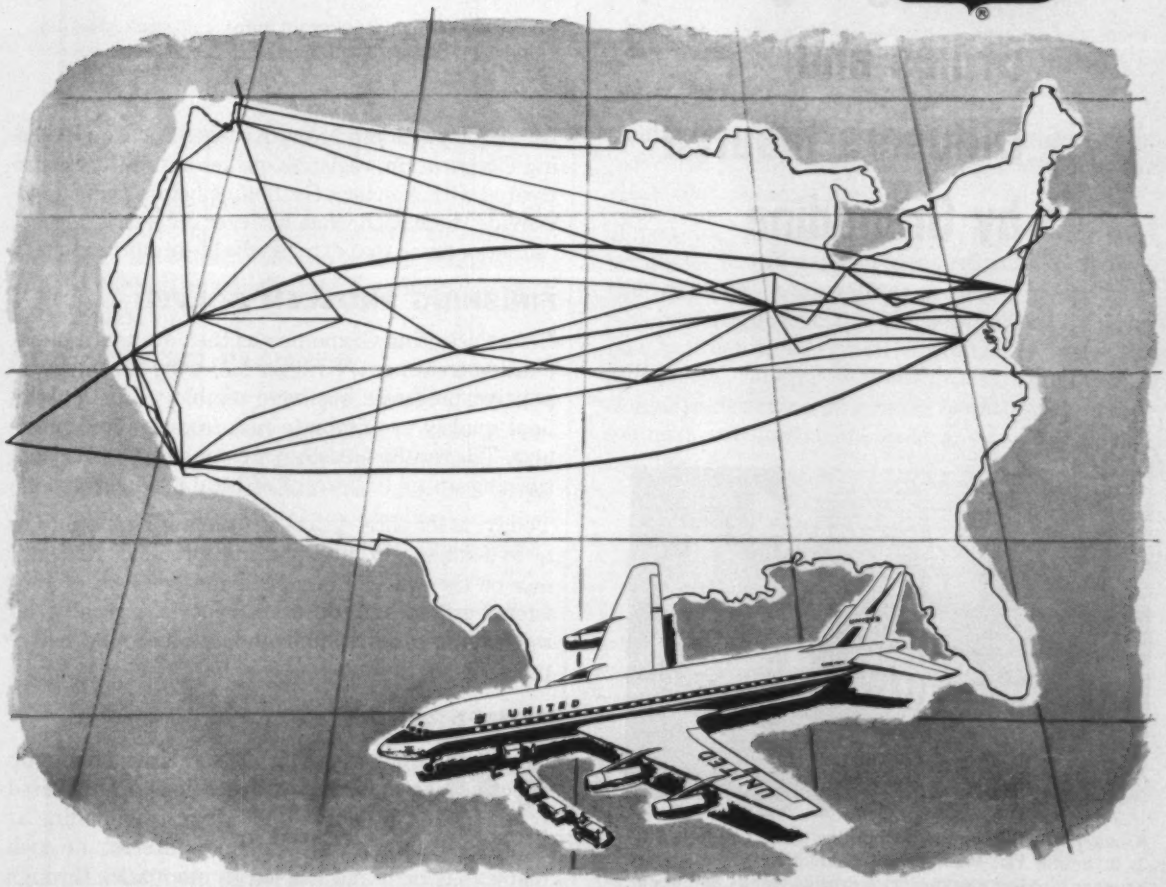
A single phone call to United Air Lines gives you fast, dependable Air Freight throughout the U.S.A. or most anywhere in the world—on a single air bill, with one-carrier responsibility. United's unique Reserved Air Freight enables you to reserve freight space as you would a passenger seat . . . on the flight most convenient for you. And this service is available on a fleet of fast Cargoliners and all United Mainliners, including 600-mph jets. You have a wide selection of schedules and a choice of door-to-door or airport-to-airport service. Call your local United Air Lines Sales Office or write to United Air Lines, Cargo Sales Division, 36 S. Wabash Avenue, Chicago 3, Illinois.

UNITED AIR LINES



Superior Pre-Paint Protection Racks Up More Sales,

Paint Adhesion of Air Conditioning and Heating Registers, Grilles and Diffusers Insured by Granodine

Precision forming equipment turns coil stock steel into product at Krueger plant.

At major parts producer, Krueger Air Conditioning Corporation, registers, grilles and diffusers are treated with Amchem Granodine before painting to provide them with what Krueger officials agree is a "superior finish that extends the life of our products."

FINISHING PROBLEM SOLVED

Before selecting Granodine as their standard phosphating treatment, Krueger had tried several competitive processes but were unable to sustain the final quality or eliminate rust from painted products. The results—customer complaints and rejects running up to 10 percent of total production.

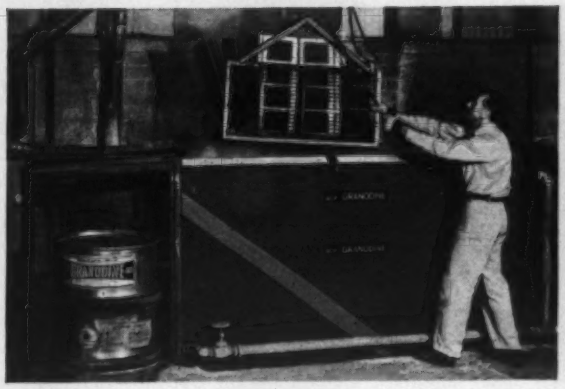
Today, after three years of utilizing Granodine in a five-stage dip phosphating process, Krueger, one of the world's largest manufacturers of registers, grilles and diffusers reports virtually no rejects, increased volume and an all-around better paint finish.

COMPARISONS SELL

To tell their superior finish story Krueger sets up effective side-by-side demonstrations of untreated products and products treated with Granodine at heating trade shows. Customer interest in such displays is high and has led to more sales through

Krueger management-manufacturing team: Left to Right—J. B. Smith, Vice-President of Production; President Leo Krueger; and Ted Kleckner, Vice-President and Comptroller.

# of Amchem GRANODINE*
Fewer Rejects For Krueger



Operator employing electric hoist, lowers load of Krueger products into Granodine dip tank.

Paint line conveyor carries painted Krueger products from water-washer spray booth to inspection area.

graphic illustration of competitive advantages on Krueger's part.

Further support comes to Krueger through the use of Granodine when bidding for and successfully securing Government contracts and projects involving architects where rigid specifications exist for pre-paint finishing.

NEW SYSTEM PLANNED

Looking to the future, Krueger—with a 400 percent increase in sales over the last six years—is currently adding a new 10 acre, 100,000 square foot plant. High on the planning list is a new and virtually completely automated Granodine line. Amchem engineers have designed a unique conveyorized system utilizing overhead cleaning, rinsing and coating of Krueger products which will achieve significant cost savings and substantial reduction in gas consumption through a colder method in the clean-coat phase of the process.

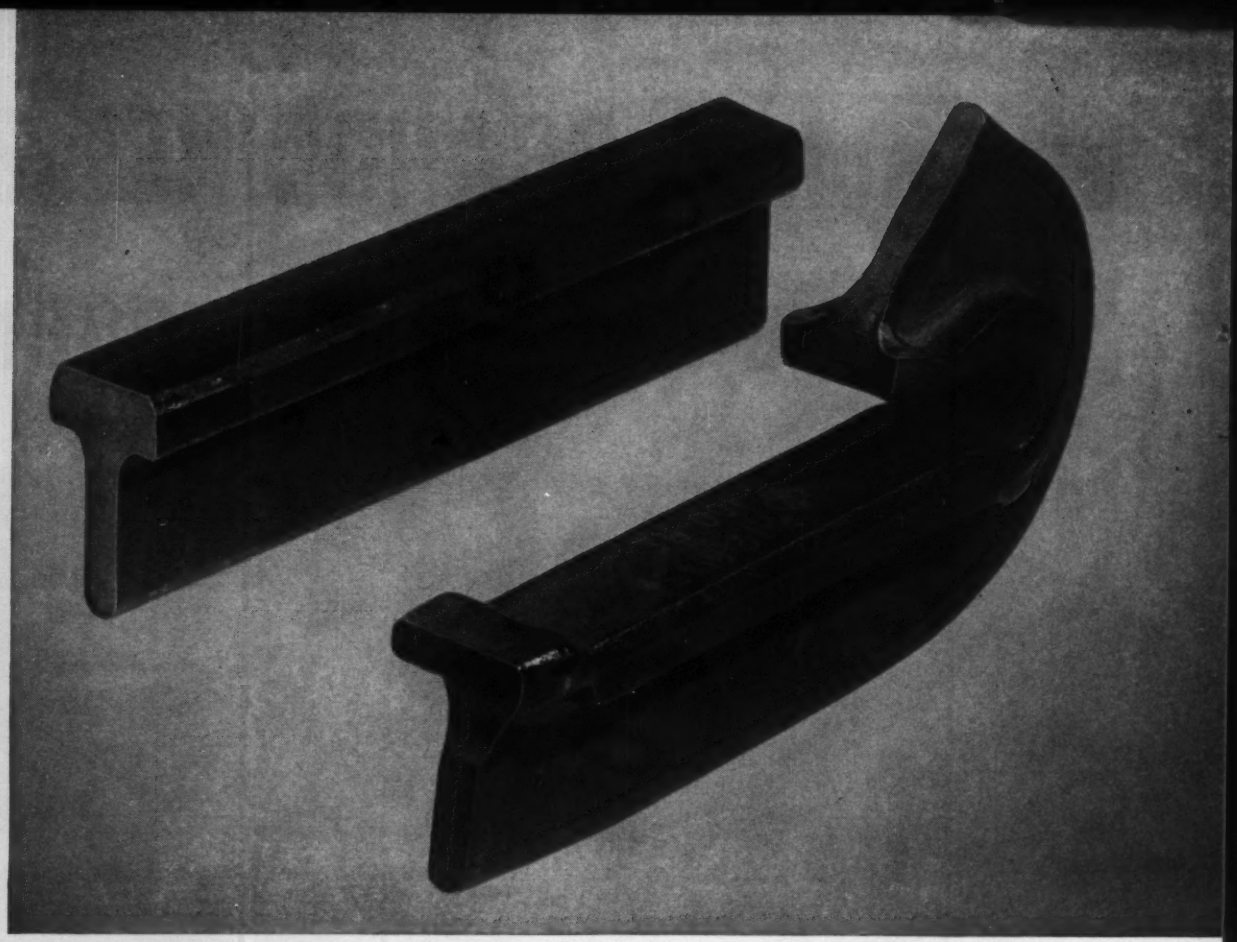
If you are interested in a *superior finish* for steel products—it will pay you to investigate Granodine, the *superior phosphating* process. Your local Amchem Representative can supply the details on how you can quickly and conveniently make the switch to Granodine without interrupting production or re-designing processing facilities, while providing a substantial increase in quality of product finish!

Write for Bulletin 1380B containing detailed information on Granodine for steel . . . the finish that lasts.

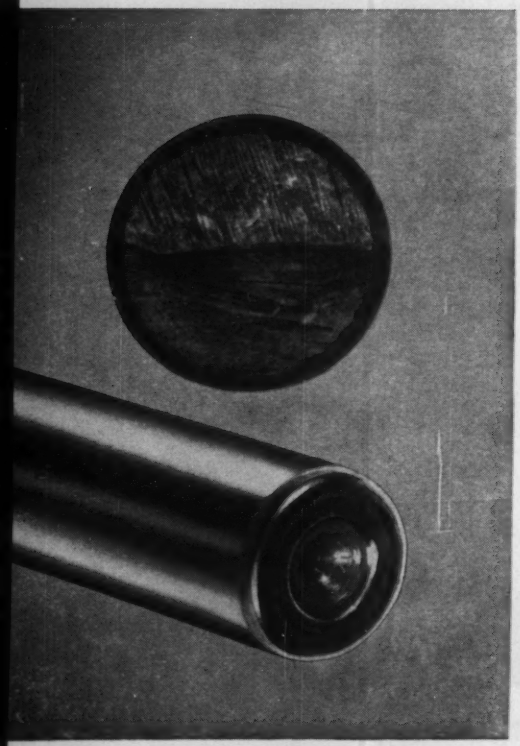
*Granodine is Amchem's registered trademark for the conversion coating chemical used to produce phosphate coatings on steel.

AMCHEM ® GRANODINE

Amchem is a registered trademark of **AMCHEM PRODUCTS, INC.** (Formerly American Chemical Paint Co.)
AMBLER, PA. • St. Joseph, Missouri • Detroit, Michigan • Niles, California • Windsor, Ont.



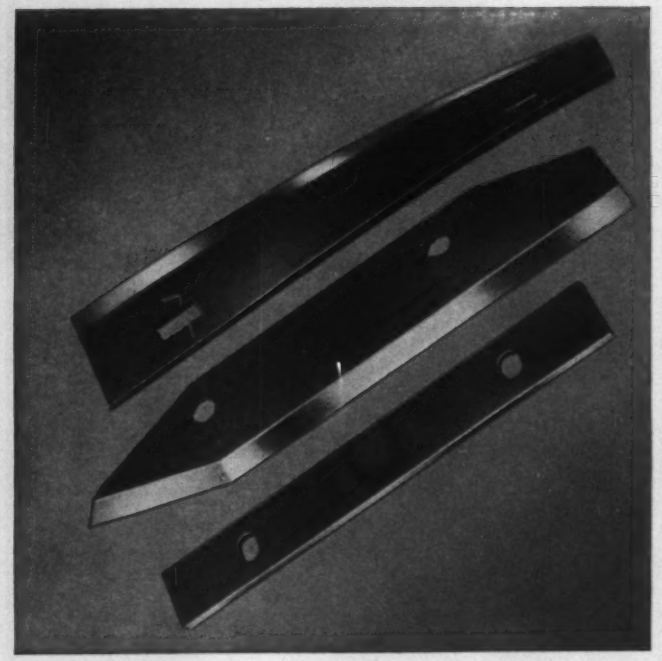
REPUBLIC HOT ROLLED SPECIAL SECTION REDUCES COST on this rail anchor through elimination of most machining and forming operations. The special section is preformed to the predominating cross section of the part. If you design or produce steel parts you will be interested in these advantages of Republic Special Sections: (1) Almost limitless flexibility in design. (2) One-piece shapes replace costly assemblies. (3) Simplification of built-up, interlocking or associated parts. Republic Special Sections are available hot rolled or cold drawn in carbon, alloy, titanium, and stainless steel. Send coupon for full facts.



3-D METALLURGICAL SERVICE HELPS AGRICULTURAL KNIFE MANUFACTURER SLASH PRODUCTION COSTS. Lund Products Company, Maynard, Massachusetts, produces cutting knives for agricultural equipment. A quality product, Lund wanted to make them better to withstand even the most severe abuse. Republic metallurgists offered advice on practices and procedures in working alloy steels. The result? A superior cutting knife, produced at a substantial reduction in cost. 3-D Service is available to all steel users without obligation. Clip and mail coupon.

COLD DRAWN CARBON CORRECTED BARS HELP BOOST PISTON PIN PRODUCTION. A leading engine manufacturer was experiencing production difficulties and was not satisfied with piston pin quality from a performance standpoint. On the advice of a Republic Field Metallurgist, the company switched to Republic Cold Drawn Carbon Corrected Bars. The results were immediate. Production increased substantially. Rejects dropped to a minimum. Pin quality maintained at the highest level. Other advantages of Cold Drawn Carbon Corrected Bars include: Better machinability. Savings in both metal and money by eliminating waste. No need to buy bars oversize to allow for decarb removal. Note induction hardening in cutaway view of the piston pin.

YOU BENEFIT SEVEN WAYS FROM REPUBLIC STEEL BAR "SERVICE IN DEPTH"



Steel bar service in depth is an exclusive Republic concept, designed to help you solve steel bar problems and to benefit you these seven ways:

1. Facilities — Republic bar mills are strategically located in relation to major use areas. Hot rolled mills at Cleveland, Youngstown, Buffalo, Massillon, Chicago, Canton, Gadsden; cold finished mills at Massillon, Gary, Beaver Falls, Hartford, and Los Angeles.

2. Abilities — Republic's broad and specialized experience has been gained as the nation's number one producer of alloy and carbon bars, and leader in the production of special quality steels, such as forging bars.

3. Shapes and Sizes—Modern bar mills produce a complete range of sizes and materials—carbon, alloy, stainless, and titanium—in ¼″ to 10″ rounds, also squares, hexagons, octagons, flats, and special sections.

4. Variety—In addition to regular merchant quality, production includes coil spring and spring bar quality, cold heading and cold extrusion quality, high quality alloy and carbon steel bar products in heavier weight coils.

5. Quality—Republic combines quality control at every step of production with the most advanced features of bar mill design to meet today's exacting requirements for high quality steel bar products.

6. Dependability — Republic's aim has been to build capacity to provide more steel tonnage for existing customers as well as supply additional users. Assurances of steel to customers are real assurances. Orders are not taken by Republic unless capacity is available to fill them.

7. Metallurgical Service — Republic's famed 3-Dimension Metallurgical Service Teams—field, mill, and laboratory—are always available to help your personnel apply Republic's high quality bar products to your product. Carbon, alloy, stainless, and titanium metallurgists will assist in the selection, application, and processing of the right bar product for the job. No obligation. The coupon is your invitation to use this service.

Here are three examples of steel bar *service in depth.*

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. IA-7700-B
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Have a metallurgist call: ☐ Carbon ☐ Alloy ☐ Stainless
Send more information on:
☐ Cold Drawn Special Sections ☐ Alloy Steel Bars
☐ Carbon Corrected Bars

Name_____ Title_____

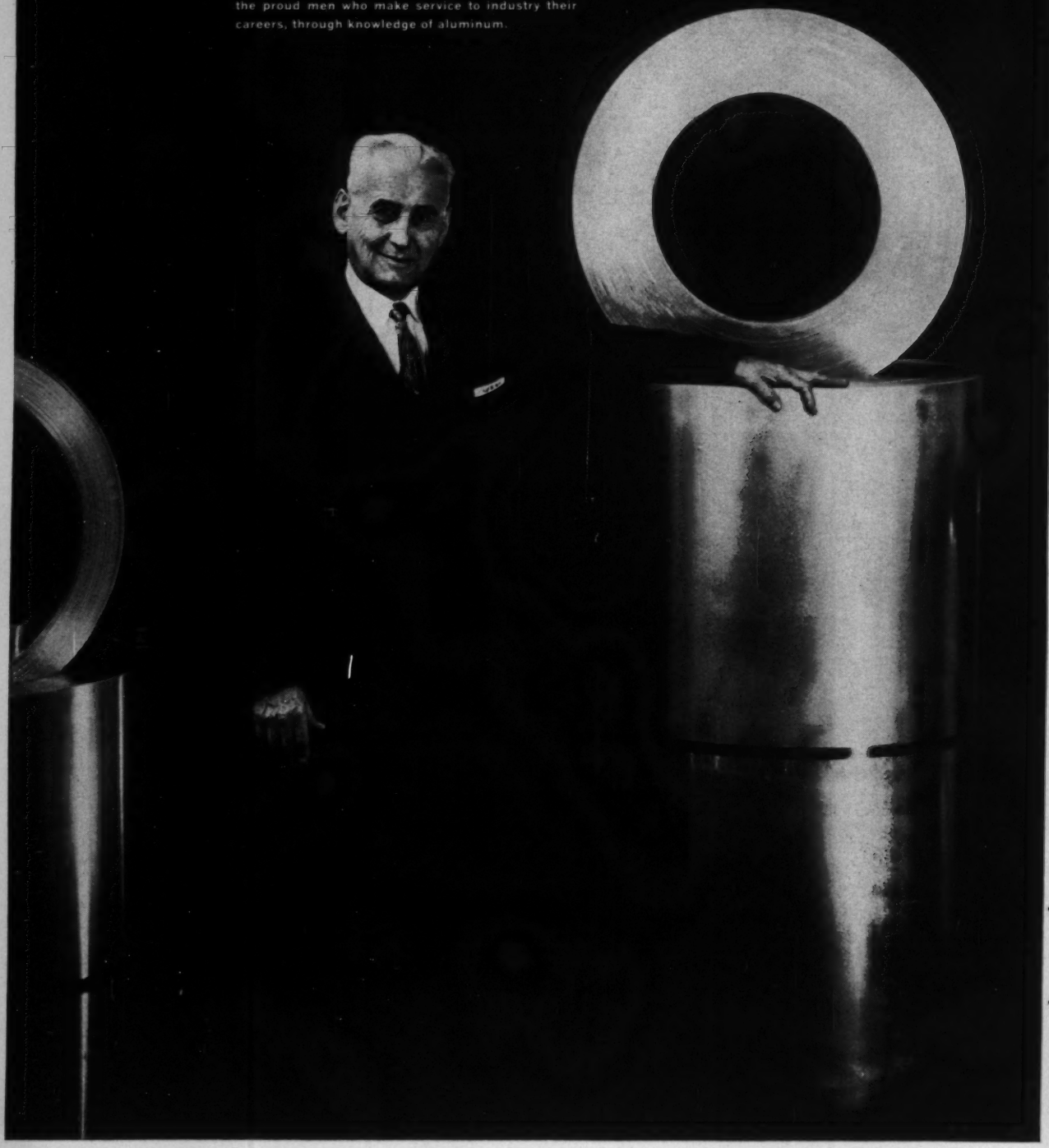
Company_____

Address_____

City_____ Zone____ State_____

The Aluminum Man*...

*Six years as an aluminum-for-industry enthusiast, Earnest J. Keys—Alcoa Distributor Salesman for Meier Brass & Aluminum Co., Detroit, Mich.—is another of the proud men who make service to industry their careers, through knowledge of aluminum.



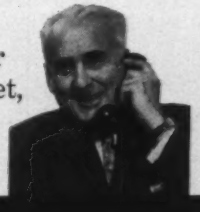
He helps cut your finished cost on sheet products

Aluminum coiled sheet in the broadest range of sizes, types and finishes in the industry . . . available from local warehouse stocks. That is why you can now receive fast delivery from your local Alcoa Distributor Salesman—*The Aluminum Man!*

Light in weight, high in strength and easy to work—produced to the highest standards of quality control—Alcoa® Aluminum Coiled Sheet can effectively reduce handling, labor and production costs. And less factory fabrication means *lower finished cost,* too!

Check *The Aluminum Man*—he'll help you determine *how* and *where* you can improve stamping machine operations by drawing on the knowledge acquired by Alcoa in more than 60 years of pioneering new aluminum uses. His aid and advice are yours for the asking, whether you buy a few pounds or a few thousand pounds of Alcoa Aluminum . . . the light metal with the bright future that's being seen in more places . . . more and more! Aluminum Company of America, 926-G Alcoa Building, Pittsburgh 19, Pa.

Call *The Aluminum Man.* He's your Alcoa Distributor Salesman for sheet, tube, shapes, screw machine stock and other Alcoa Mill Products.



ALCOA ALUMINUM

DISTRIBUTED NATIONALLY...
TO BETTER SERVE YOUR IMMEDIATE NEEDS

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Birmingham
*Hinkle Supply Co., Inc. (Fairfax 2-4541)
The J. M. Tull Metal & Supply Co., Inc. (Fairfax 3-1612)

ARIZONA
Phoenix
Ducommun Metals & Supply Co. (Bridge 5-4471)

CALIFORNIA
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Ducommun Metals & Supply Co. (Thornwall 1-1820)
Los Angeles 54
*Ducommun Metals & Supply Co. (Ludlow 8-0161)
Los Angeles 22
*Pacific Metals Co., Ltd. (Raymond 3-5431)
Tubesales (Tube and Pipe) (Raymond 3-7781)
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*Pacific Metals Co., Ltd. (Underhill 3-5600)

COLORADO
Denver 16
Marsh Steel & Aluminum Co. (Keystone 4-1241)
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Milford
*Edgcomb Steel of New England, Inc. (Trinity 4-1631)
Windsor
Whitehead Metals, Inc. (Murdock 8-4921)

FLORIDA
Jacksonville 5
The J. M. Tull Metal & Supply Co., Inc. (Evergreen 7-5561)
Miami
The J. M. Tull Metal & Supply Co., Inc. (Oxford 6-0150)
Tampa 10
The J. M. Tull Metal & Supply Co., Inc. (3-6741)

GEORGIA
Atlanta 2
*The J. M. Tull Metal & Supply Co., Inc. (Jackson 5-3871)

HAWAII
Honolulu 14
Aluminum Products Hawaii, Ltd.

IDAHO
Boise
Pacific Metal Co. (3-6468)

*Home Office

ILLINOIS
Chicago 80
*Central Steel and Wire Co. (Republic 7-3000)
*The Corey Steel Co. (Bishop 2-3000)
*Steel Sales Corporation (Bishop 7-7700)

INDIANA
Indianapolis 18
Steel Sales Co. of Indiana, Inc (Liberty 6-1535)

KANSAS
Wichita
Marsh Steel & Aluminum Co. (Whitehall 2-3231)
Wichita 16
Metal Goods Corp. (Amherst 5-3191)

KENTUCKY
Louisville 3
Williams and Company, Inc. (Juniper 3-7781)

LOUISIANA
New Orleans 12
Metal Goods Corp. (Jackson 2-7373)

MARYLAND
Baltimore 5
Whitehead Metals, Inc. (Eastern 7-3200)

MASSACHUSETTS
Cambridge 39
Whitehead Metals, Inc. (Trowbridge 6-4680)
Roxbury
Eastern Metal Mill Products Co. (Highlands 2-5900)

MICHIGAN
Detroit 12
Central Steel and Wire Co. (Twinbrook 2-3200)
Detroit (Hazel Park)
Meier Brass & Aluminum Co. (Jordan 6-3902)
Detroit 10
Steel Sales Co. of Michigan (Tyler 6-3000)

MINNESOTA
Minneapolis 13
Steel Sales Co. of Minnesota (Sterling 1-4893)

MISSOURI
North Kansas City 16
*Marsh Steel & Aluminum Co. (Grand 1-3505)
Metal Goods Corp. (Grand 1-3516)
St. Louis 14
*Metal Goods Corp. (Harrison 7-1234)
St. Louis 10
Steel Sales Co. of Missouri, Inc. (Prospect 1-5255)

NEW HAMPSHIRE
Nashua
*Edgcomb Steel of New England, Inc. (Tuxedo 3-7731)

NEW JERSEY
Elizabeth
Adam Metal Supply of New Jersey (Flanders 1-2550)
Harrison
Whitehead Metals, Inc. (Humbolt 5-5900)
Hillside
Miller Steel Company, Inc. (Waverly 6-6000)
Kenilworth
Jones & Laughlin Steel Corp. Strip Steel Division (Murdock 6-6900)

NEW YORK
Albany 1
*Eastern Metals Warehouse, Inc. (89-3281)
Buffalo 7
Brace-Mueller-Huntley, Inc. (Victoria 8700)
Whitehead Metals, Inc. (Bedford 3100)
New York (Long Island City 1)
*Adam Metal Supply, Inc. (Stilwell 6-7737)
New York (Brooklyn)
Strahs Aluminum Co., Inc. (Browning 2-7000)
New York 14
*Whitehead Metals, Inc. (Watkins 4-1500)
Rochester 1
Brace-Mueller-Huntley, Inc. (Congress 6-6560)
Syracuse 1
*Brace-Mueller-Huntley, Inc. (Howard 3-3341)
Syracuse 4
Whitehead Metals, Inc. (Howard 3-6241)

NORTH CAROLINA
Charlotte 6
Edgcomb Steel Co. (Franklin 5-3361)
Greensboro
Edgcomb Steel Co. (Broadway 5-8421)

OHIO
Cincinnati 16
Central Steel and Wire Co. (Avon 1-2230)
Cincinnati 29
Williams and Company, Inc. (Capitol 1-3000)
Cleveland 2
*A. M. Castle & Co. 4510 Division Avenue (Atlantic 1-5100)
Cleveland 14
Williams and Company, Inc. (Utah 1-5000)
Columbus 8
Williams and Company, Inc. (Axminster 4-1623)
Toledo 12
Williams and Company, Inc. (Greenwood 5-8661)

OKLAHOMA
Tulsa 13
Metal Goods Corp. (Temple 6-2561)

OREGON
Portland 9
*Pacific Metal Co. (Capitol 7-0693)

PENNSYLVANIA
Philadelphia 34
*Edgcomb Steel Co. (Garfield 3-6300)
Philadelphia
Metal Supply Co. (Center 6-0220)
Philadelphia 40
Whitehead Metals, Inc. (Baldwin 9-2323)
Pittsburgh 33
*Williams and Company, Inc. (Cedar 1-8600)
York
Edgcomb Steel Co. (47-1411)

RHODE ISLAND
Slatersville
Edgcomb Steel of New England, Inc. (Poplar 7-0900)

SOUTH CAROLINA
Greenville
The J. M. Tull Metal & Supply Co., Inc. (Cedar 3-8366)

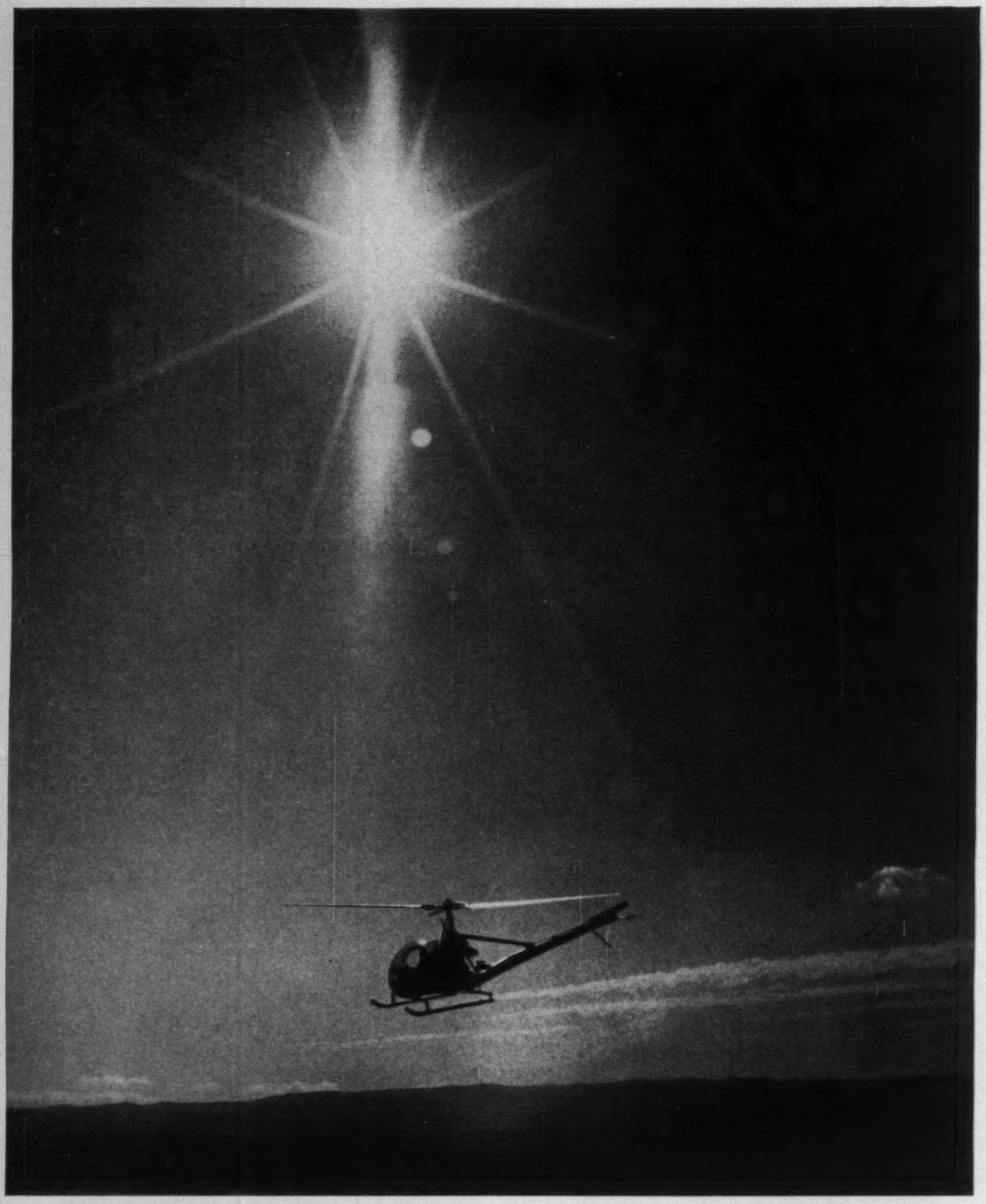
TENNESSEE
Memphis 6
Metal Goods Corp. (Whitehall 8-3407)

TEXAS
Dallas 9
Metal Goods Corp. (Fleetwood 1-3271)
Houston 21
Metal Goods Corp. (Republic 3-5441)

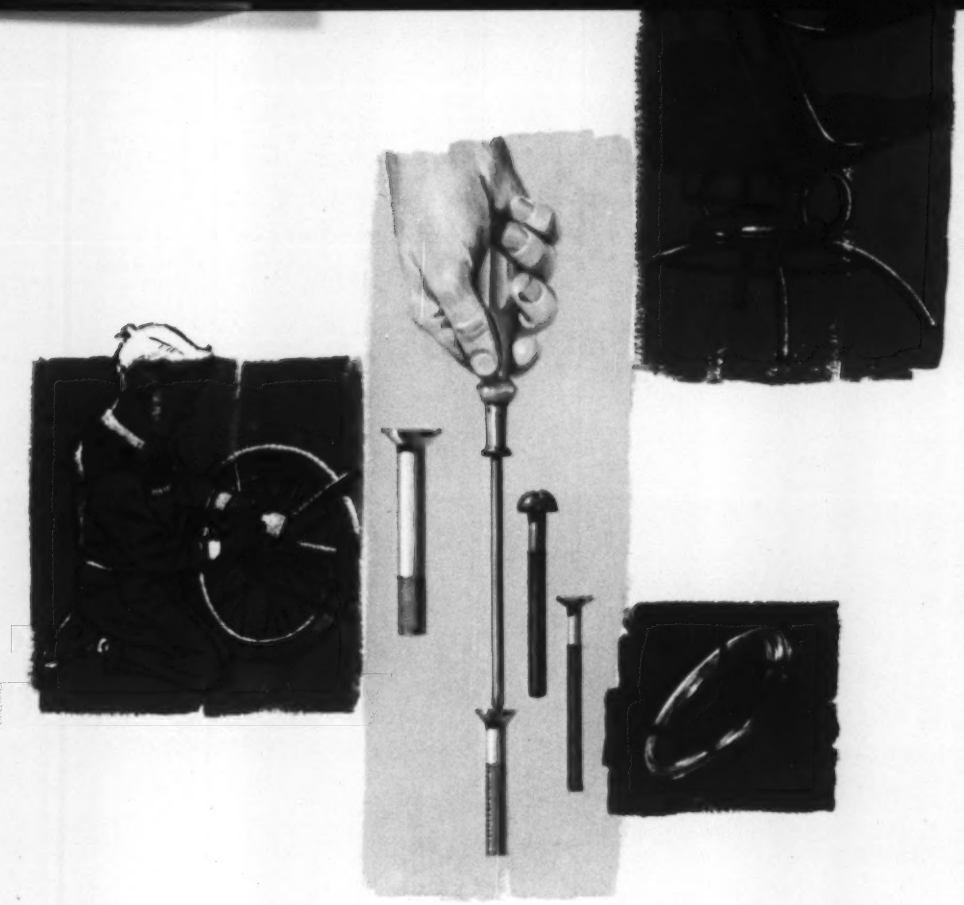
UTAH
Salt Lake City 1
Pacific Metals Co., Ltd. (Davis 2-3461)

WASHINGTON
Seattle
Ducommun Metals & Supply Co. (Parkway 5-1500)
Seattle 4
Pacific Metal Co. (Main 2-6925)

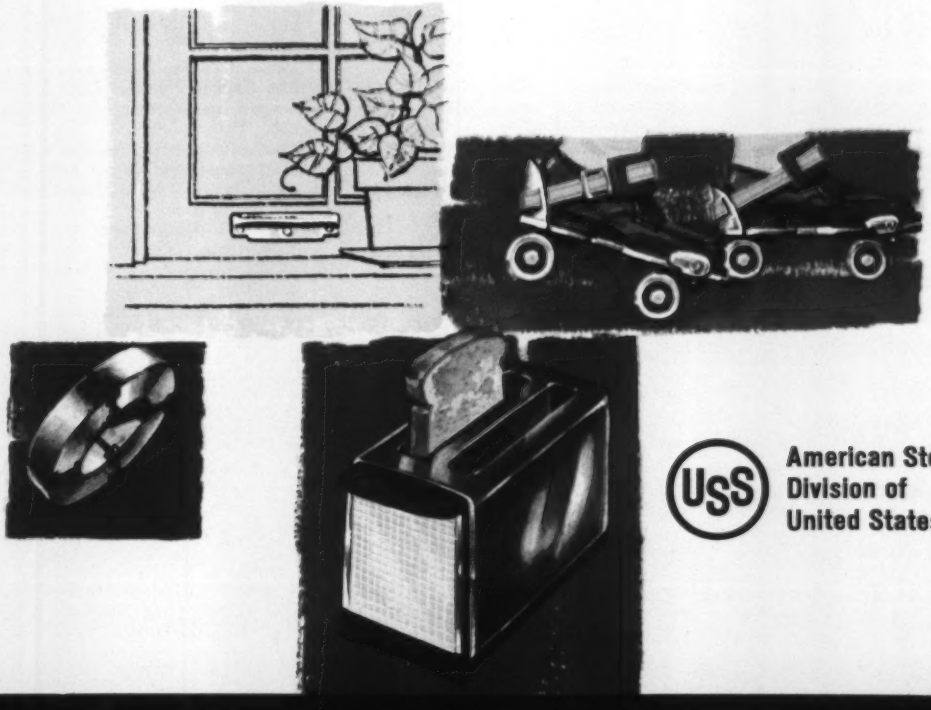
WISCONSIN
Milwaukee 1
Central Steel and Wire Co. (Humboldt 1-5000)
Milwaukee 9
Steel Sales Co. of Wisconsin (Hilltop 2-2020)



This bird grew up in a Gas-heated nest. The nest is the plant of Hiller Aircraft Corporation in Palo Alto, California, where gas is used exclusively in the heat processing of aircraft parts. From the big bubble up front to the rotor blades in its tail, nearly every part of a Hiller helicopter is processed with gas heat. Gas heat cures plastics, anneals metals, dries paint, heats solutions for plating . . . keeps the plant itself warm in winter. Hiller Aircraft—and thousands of other companies—use gas heat because it is completely controllable, fast, clean, economical. Gas is technically right and economically sound for all types of heat processing. Call the Industrial Sales Engineer at your local gas company for specific technical help. *American Gas Association.* **FOR INDUSTRIAL HEATING GAS IS GOOD BUSINESS**



Quality products call for quality wire, bars and strip . . .



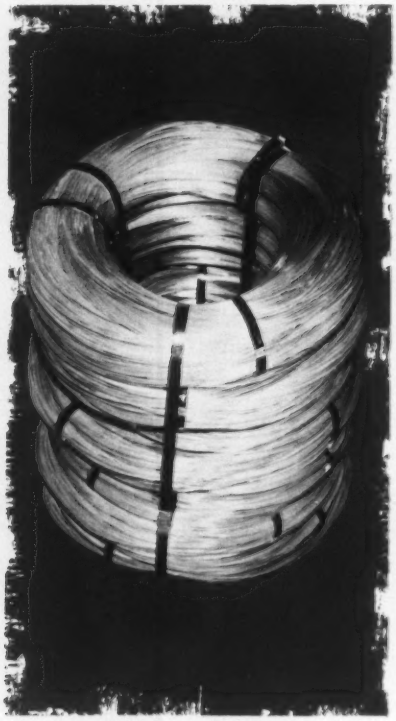
USS

American Steel & Wire
Division of
United States Steel

USS American Quality Manufacturers Products packaged to speed up handling and save storage space

Standard Coils: American Steel & Wire manufactures standard coils in weights suited to your material handling equipment.

Heavyweight Coils: These continuous wire coils, weighing up to 2,000 pounds, speed up your production by reducing down time for setups and changes. One large coil takes the place of several smaller coils of same total weight—are much easier to handle . . . require much less storage space.



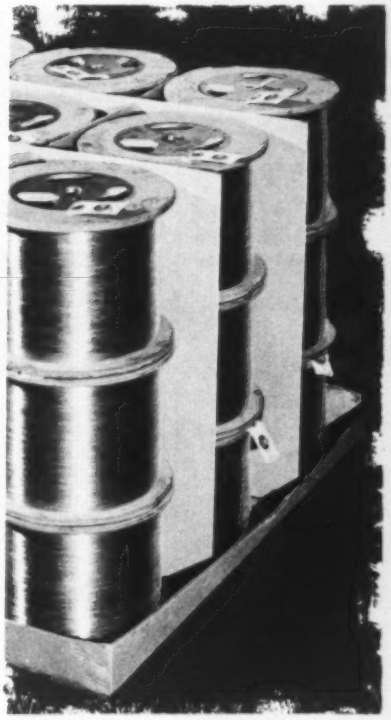
Unitized Coils: These unit packs offer great savings in handling time and storage space. One unit, containing several coils, is easily handled; takes up less storage space than the same coils stored separately.

. . . quality controlled to help you make good products better

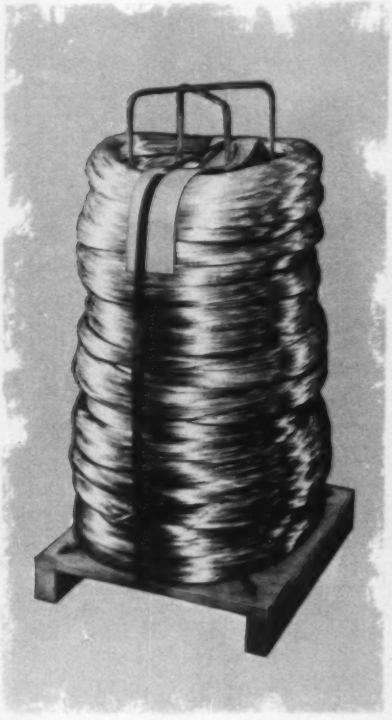
To mass produce this bicycle padlock the Master Lock Company uses USS Amer-Led Steel Bars. This leaded steel permits increased machining speed over equivalent non-leaded grades. The use of USS Amer-Led results in more accurate forming; . . . fewer rejects.

American Steel & Wire products and service facilities are available to you at no increase in cost. It will pay you to use these advantages. The quality and uniformity of USS American Manufacturers Wire brings you production economies through easier processing and fewer rejects. It makes a superior finished product that is more salable. And it is available in all the modern money-saving forms:

Pay-off Drums: Long-run continuous coils of wire are packed and delivered in heavy fibre containers. These Pay-off Drums are easy to handle and stack for storage. These are ideal for use where wire finish requires special protection from dirt and corrosive atmospheres. Available in most wire sizes with length and weight of coil to your specifications. You do not need to return drums.

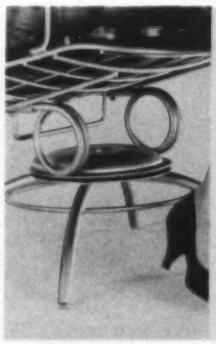


Disposable Spools: These new non-returnable spools can be supplied with any amount of fine wire—from 5 lbs. to 100 lbs. These are easy to handle individually, and when shipped in quantity are delivered 36 to a pallet, ready for storage.



Platform Coil Carrier: The disposable platform carrier, made up of a U-shaped wire frame fastened to a platform, holds up to 3,000 pounds of special wire in one continuous length. It is often ideal for ordering and handling quantities of wire.

American Screw Company turns out 14 million recessed head fasteners a day. Their most famous patent is the Phillips Head Screw, for which American Steel & Wire developed a special cold heading wire, hard enough to produce strong, tough fasteners, yet soft enough to avoid splits and cracks when the Phillips punch is rammed into the coning blank.



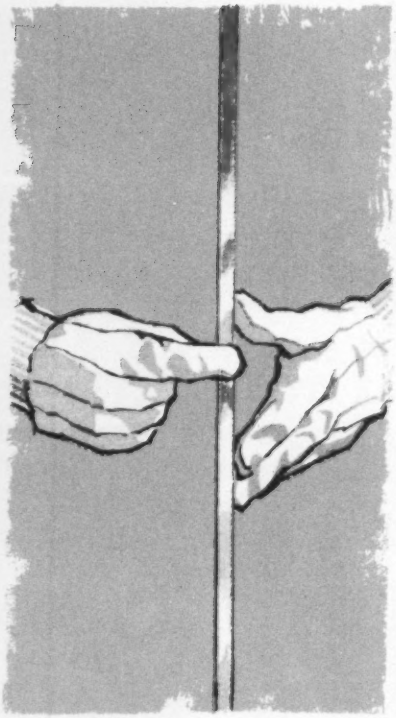
The pair of round wire helical single coil torsion springs on this chair were specially made for the Homecrest Company of Wadena, Minnesota. Under a 250-pound weight, the chair was test rocked 750,000 times without showing any sign of failure. *Another success story for USS American Manufacturers Products.*

American Steel & Wire
Division of
United States Steel

USS

USS Amerstrip . . . gives you precisely what you need in a cold rolled strip

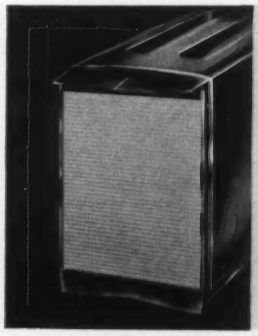
Precision Finish. With USS Amerstrip we take special pains to give you a finish that is just right for the specific results you require in a finished product. We believe the Amerstrip finish is the finest you can get in the industry.



Precisely Prepared Edges. Because USS Amerstrip is produced in order-sized quantities engineered to your own specifications, we can give you exactly the edge finish you need—square, standard, round, full round or bevel.

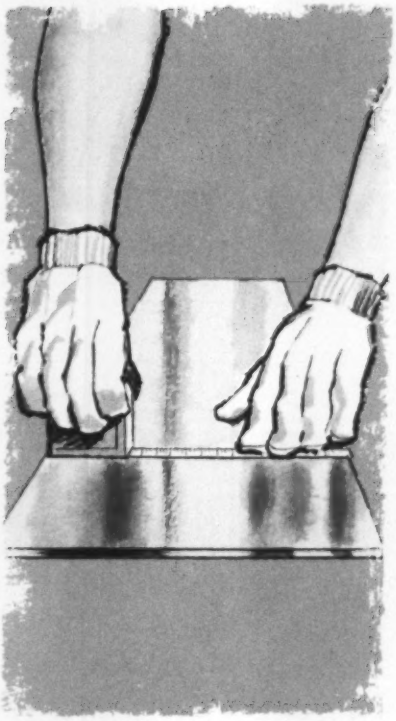
Precise Tempers. Whether your product must go through a deep draw or undergo other stringent forming operations, or if it requires a special temper for rigidity, you'll get the correct temper for the job when you order USS Amerstrip.

. . . to speed up production and keep your product quality high!



Much of the sales-pulling beauty of Proctor Electric Company's modern toaster is due to the use of gold-finished, geometric-patterned USS Embossed Amerstrip. American Steel & Wire specializes in the rolling of special embossed designs such as this for specific applications. Perhaps you, too, have a product which could be made more beautiful and more sales appealing with Embossed Amerstrip.

USS Amerstrip is a specialty product that has opened vast new production and sales possibilities for a growing number of alert manufacturers of consumer products. It is available in a variety of attractive finishes—plain or embossed. It permits production on precision machines. When you use USS Amerstrip, you get six distinct advantages not easily obtainable with other manufacturing methods or materials:



Precise Width Tolerances. When your fabricating machines require a special width strip, you can be sure that's the width you'll get. We can produce USS Amerstrip within required tolerance limits to fit your special requirements.

Precise Thickness Tolerances. Whatever the thickness tolerance your machines demand, USS Amerstrip can give it to you. We can roll Amerstrip down to thickness tolerances of plus or minus .0005 inches.

Precise Uniformity. Regardless of the size of your order every coil of USS Amerstrip comes off the line uniform in finish, temper, width and thickness. In short, USS Amerstrip's precision production assures a continuous run and high yield.

Amerstrip is used in the manufacture of almost every part of the 15 types of Hustler Corporation skates made by Frantz Manufacturing Co. These skates will stand up under the punishing wear children may give them—yet maintain their attractive finish. Amerstrip is tailored to each particular job . . . has the physical properties to assure a good performance and efficient manufacture.

Amerock Corporation of Rockford, Illinois, makers of sash lifts, had trouble finding a strip steel that would meet its severe double drawing operation requirements. They brought the problem to American Steel & Wire. Our metallurgists recommended a type of USS Amerstrip tailored to their deep drawing requirements and capable of holding a finish suitable for plating.

American Steel & Wire Division of United States Steel

USS

Facilities and service second to none!

As the country's largest manufacturer of wire and strip, we offer a *single source of supply* for all your varied manufacturers' wire and strip requirements.

Widespread *modern facilities* assure that your product will be made exactly to specification, thoroughly uniform in quality and dimension.

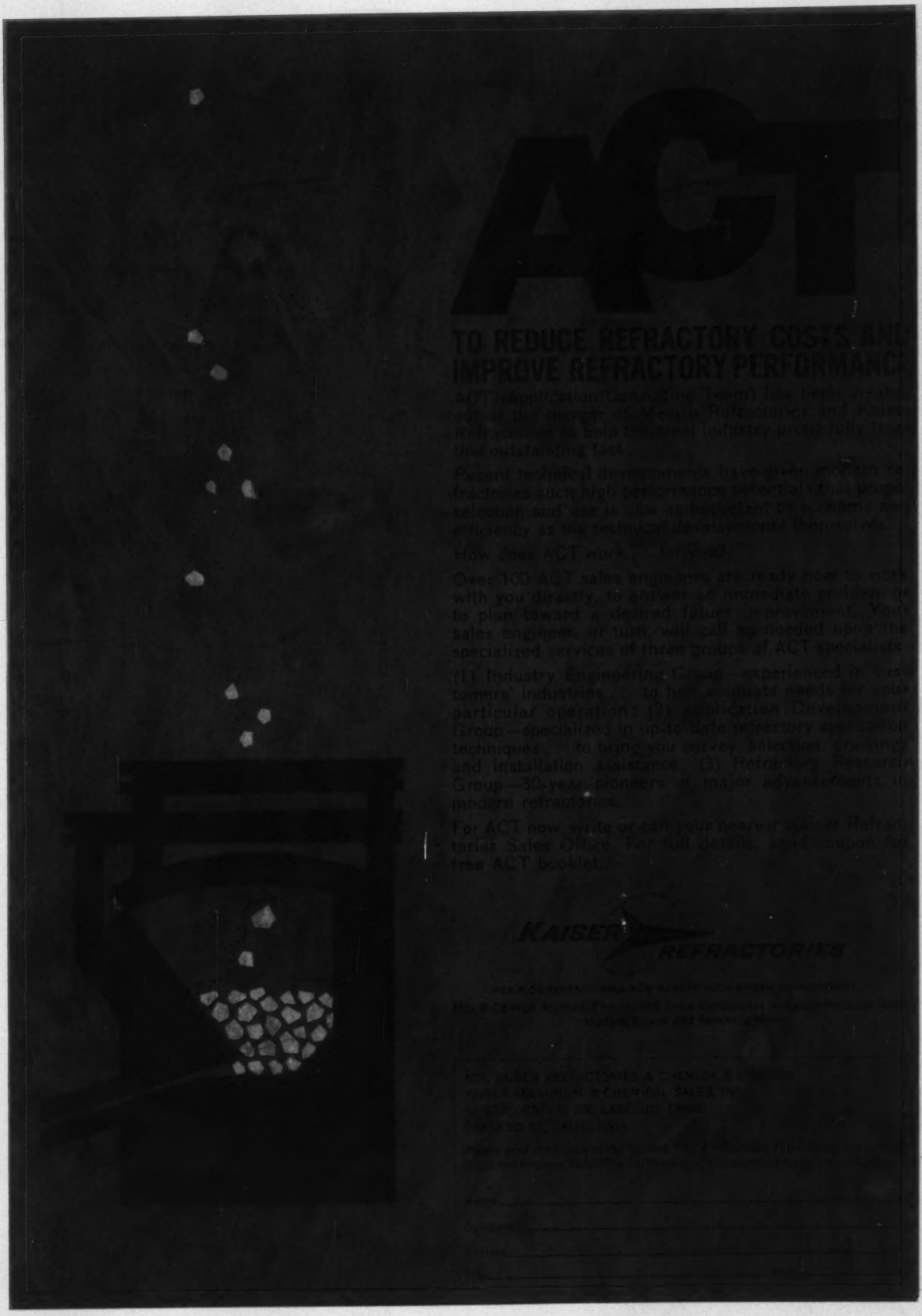
Experienced sales representatives are at your service to assist in determining how USS American Manufacturers Products can help make *your* product better.

For more detailed information, get in touch with the nearest district office. American Steel & Wire, 614 Superior Ave., N.W., Cleveland 13, Ohio.

USS, American and Amerstrip are registered trademarks

American Steel & Wire
Division of
United States Steel

This mark tells you a product is made of modern, dependable Steel.


ACT
TO REDUCE REFRACTORY COSTS AND
IMPROVE REFRACTORY PERFORMANCE
KAISER
REFRACTORIES

This Sandusky Centrifugal Casting—one of four produced for Westinghouse Atomic Equipment Department—meets radiographic, intergranular corrosion, and all other rigorous chemical and physical tests.

ONE SANDUSKY CENTRIFUGAL CASTING ...makes 4 giant stator shells

Specified by Westinghouse for 4 canned motor pumps soon to be integral parts of reactor system in Yankee Atomic Electric Plant in Rowe, Massachusetts

One king-size 17-ton Sandusky casting supplied the main motor bodies (stator shells) for the four pumps being built by Westinghouse, each to handle 23,600 g.p.m. of pressurized water through the reactor core.

The 25-foot-long Sandusky casting was centrifugally spun of a modified CF-8 (Type 304 L) stainless steel, then machined by Sandusky to a 3" wall thickness, 31½" on the O.D. This huge casting was hydrostatically tested to 3800 psi before being sectioned into four 68" lengths.

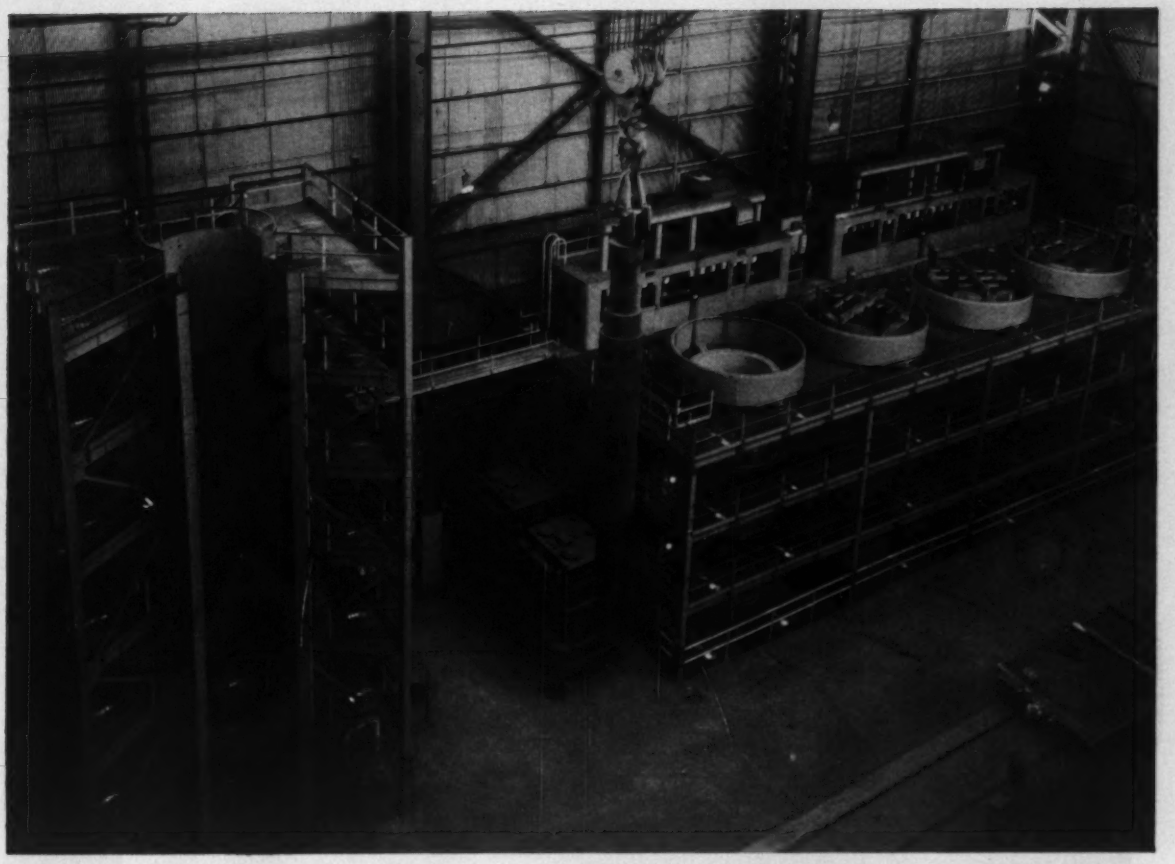
These stator shells represent another *new and exacting application* for Sandusky Centrifugal Castings—which may offer a practical and economical answer to *your* cylindrical requirements also. They are available in diameters from 7" to 54"—in lengths up to 33 feet—in heat- and corrosion-resistant stainless, carbon and low-alloy steels and a wide range of copper-base and nickel-base alloys.

Let us show you how Sandusky Centrifugal Castings can help solve your cylindrical problems. Write to us at Sandusky, Ohio.

SANDUSKY CENTRIFUGAL CASTINGS

SANDUSKY FOUNDRY & MACHINE CO.

SANDUSKY, OHIO Stainless, Carbon, Low-Alloy Steels—Full Range Copper-Base, Nickel-Base Alloys



VERTICAL FURNACES and QUENCH TOWER

at HOMESTEAD WORKS—Vertical furnaces and quench tower engineered and designed for heat treating rotors in upright position recently placed in operation at United States Steel Corporation's Homestead Works. These furnaces can accommodate electric generator rotors 40 feet in length and 60 inches in diameter.

This is another example of the ability of Amsler Morton engineers to translate a specific and unusual problem into a completely satisfactory installation.

Engineering Consultation in your plant on request

AMSLER MORTON COMPANY

ENGINEERS AND CONTRACTORS

division of TEXTRON, Inc.

In Canada: AMCO Furnace Contractors Ltd., Toronto, Ontario

MANOR BUILDING PITTSBURGH 19, PA.

size is no problem!

The bigger your tubular steel problem – the better we like it! Why? Because with all our modern facilities "under one roof," we are completely equipped to handle a variety of difficult jobs – expertly and economically! For expert consultation on centrifugally spun tube applications in your field . . . call on ACIPCO.

VERSATILE ACIPCO CENTRIFUGALLY SPUN STEEL TUBES

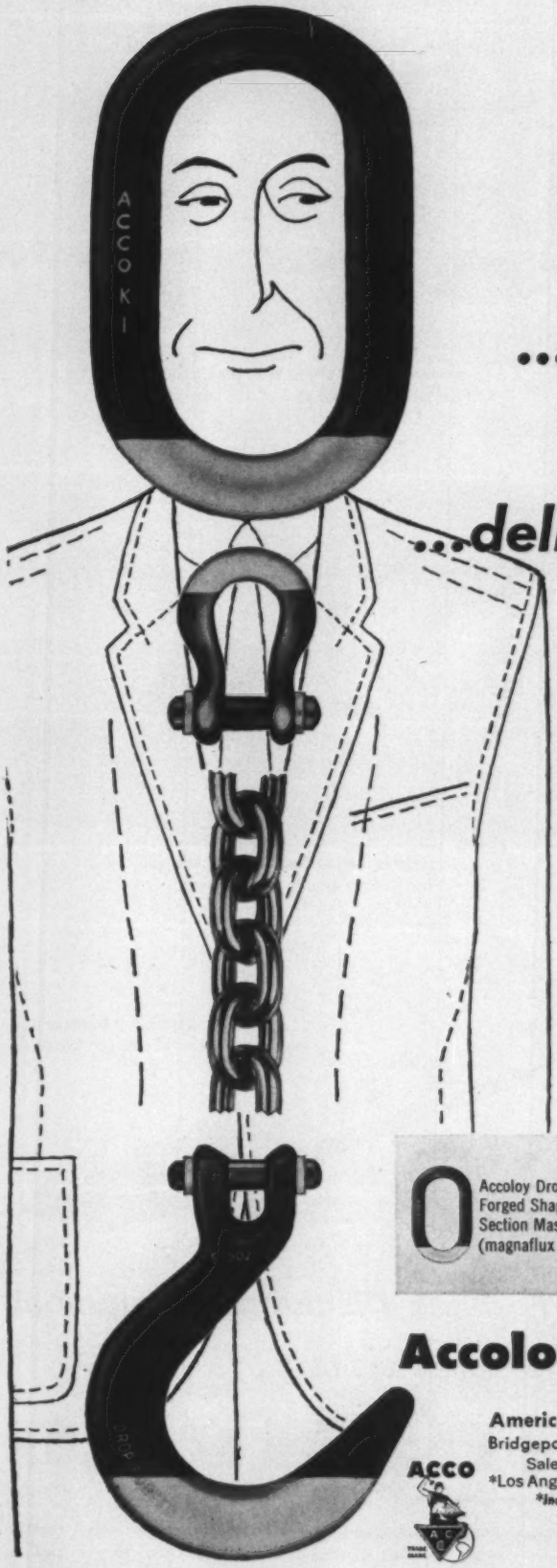
SIZE RANGE: Lengths up to 40 feet to meet modern machinery requirements have been produced. O.D.'s from 2.25″ to 50″; wall thicknesses from .25″ to 4″.

ANALYSES: All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steel, plain carbon steel and special non-standard analyses.

FURNISHED: As cast, rough machined, or finished machined, including honing. Complete welding and machine shop facilities for fabrication.

Write for FREE Illustrated Catalog.

ACIPCO
SPECIAL PRODUCTS
DIVISION OF AMERICAN CAST IRON PIPE CO.
BIRMINGHAM · ALABAMA



Kuplex Sling Chains

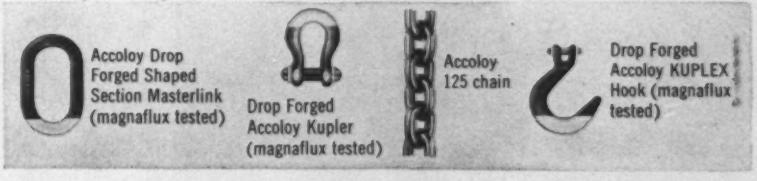
...*custom made* to your specifications

...delivered the *same day*

Now, you can have sling chains fitted to your specifications as easily as you buy a custom made suit. Your nearby Authorized Kuplex distributor is the man who will make all of this possible with same day delivery of Accoloy Kuplex Sling Chains assembled locally from matched components.

Kuplex is a safe, modern sling chain tried and proved through nationwide use. Its components are manufactured exclusively by American Chain of heat treated Accoloy steel, and factory proof-tested to be stronger than the chain itself. These facts are attested to in a Certificate of Test issued by Acco and signed by the Distributor who assembles and sells Kuplex slings.

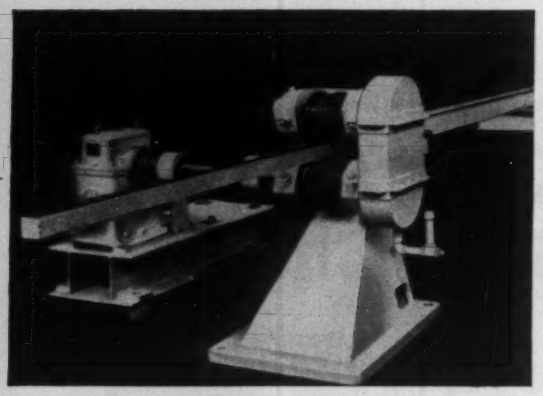
Your Authorized Kuplex distributor can supply promptly from stock the exact sling chains you require. With the four components (shown below) he can make up single, double, 3-leg and 4-leg slings in six different chain sizes (¼" through ⅞"). If you don't know his name, contact our York, Pa., office.


Accoloy Drop Forged Shaped Section Masterlink (magnaflux tested)
Drop Forged Accoloy Kupler (magnaflux tested)
Accoloy 125 chain
Drop Forged Accoloy KUPLEX Hook (magnaflux tested)

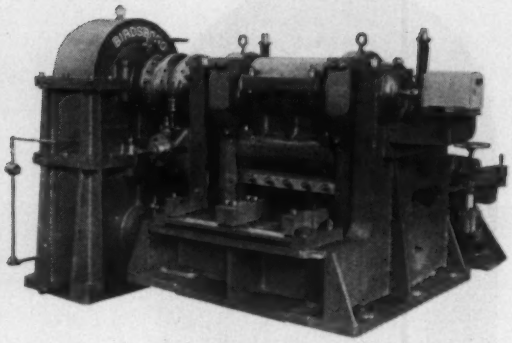
Accoloy Kuplex Sling Chains

American Chain Division • American Chain & Cable Company, Inc.
Bridgeport, Conn. • Factories: *York and *Braddock, Pa., *San Francisco, Calif.
Sales Offices: *Atlanta, Boston, *Chicago, *Denver, Detroit, *Houston
*Los Angeles, New York, Philadelphia, Pittsburgh, *Portland, Ore. *San Francisco
*Indicates Warehouse Stocks

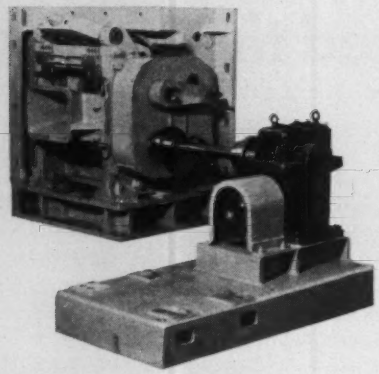
ACCO



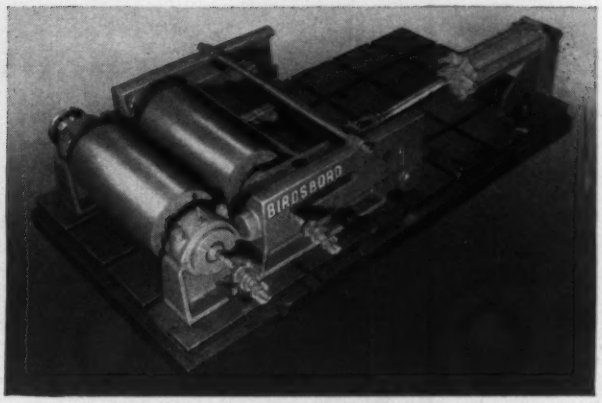
Swing type billet ejector for ejecting billets from a side discharge furnace.



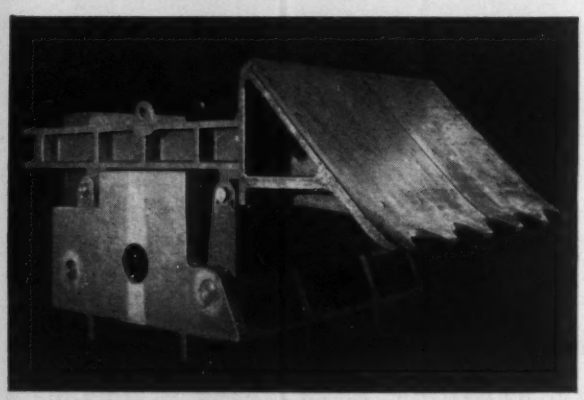
Furnace dividing shear with pinch rolls and switch for double strand mill operation.



Spring loaded discharge pinch rolls for pulling billets from furnace.

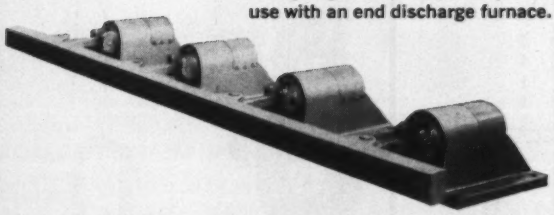


Pneumatic loaded discharge pinch rolls for pulling billets from furnace.



Heavy billet chute type spring loaded bumper for use with an end discharge furnace. The design will permit the bumper to swing clear of the table for easy table maintenance.

Spring loaded billet bumper for use with an end discharge furnace.



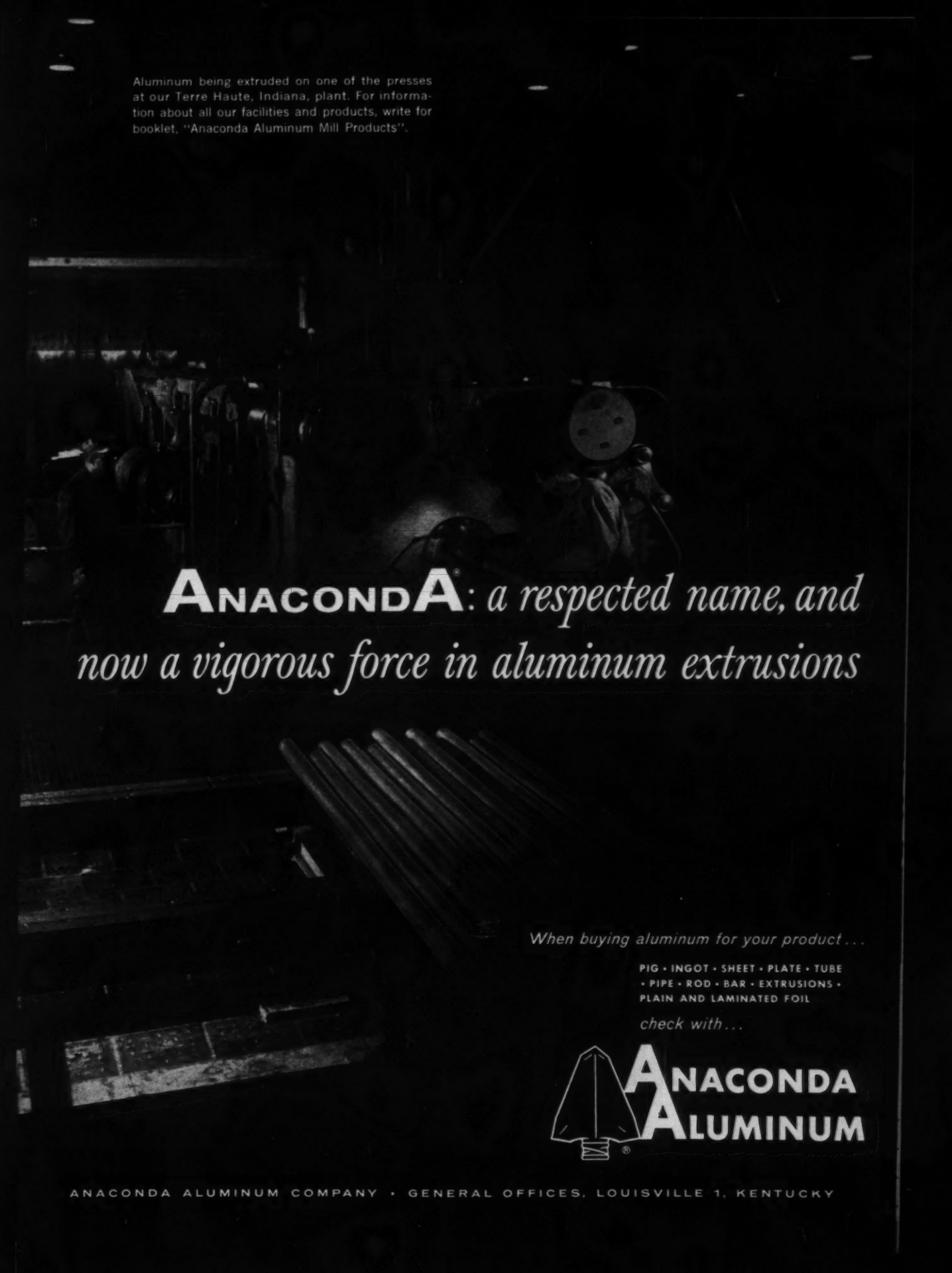
Furnace Discharge Equipment

designed and built by

MM 82-60

BIRDSBORO CORPORATION

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS
Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel • BIRDSBORO, PENNSYLVANIA



Aluminum being extruded on one of the presses at our Terre Haute, Indiana, plant. For information about all our facilities and products, write for booklet, "Anaconda Aluminum Mill Products".

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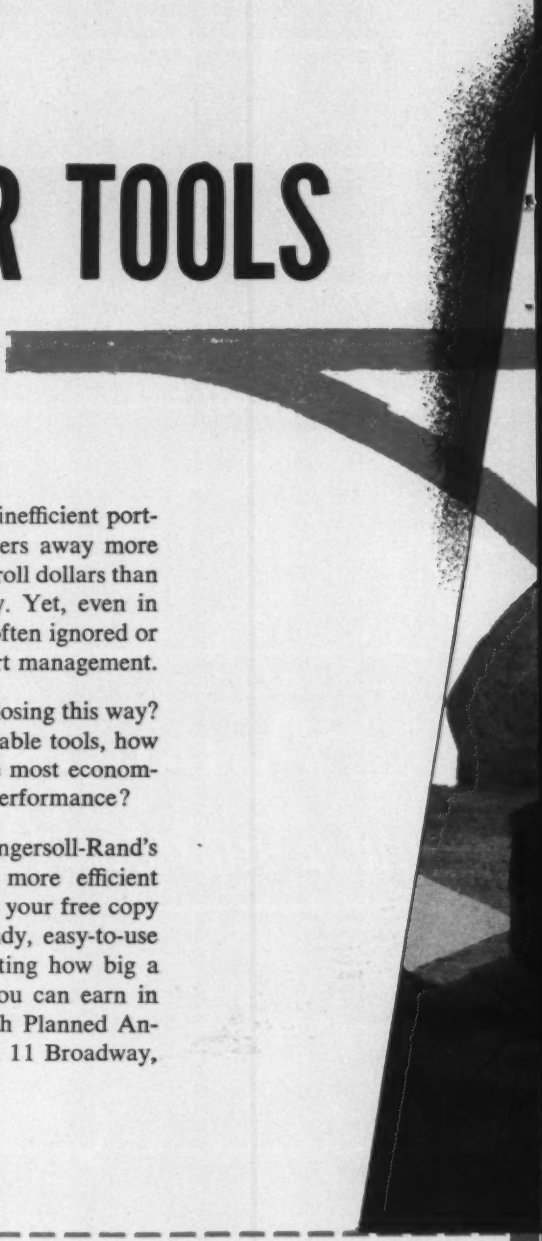
if you use

PORTABLE POWER TOOLS

...you need these



Studies show that operation of inefficient portable power tools probably fritters away more production . . . wastes more payroll dollars than anything else in industry today. Yet, even in the best-run plants, this fact is often ignored or overlooked by an otherwise-alert management.

How much production are *you* losing this way? Just how efficient are your portable tools, how do you find out, and what's the most economical way to keep them at peak performance?

You can get all the answers in Ingersoll-Rand's new illustrated guidebook to more efficient power tool operation. Write for your free copy today! With it you'll get a handy, easy-to-use *Dividend Computer* for estimating how big a Dividend on Payroll Dollars you can earn in your plant in just one year with Planned Annual Retooling. Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

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Planned Annual Retooling increases output per man

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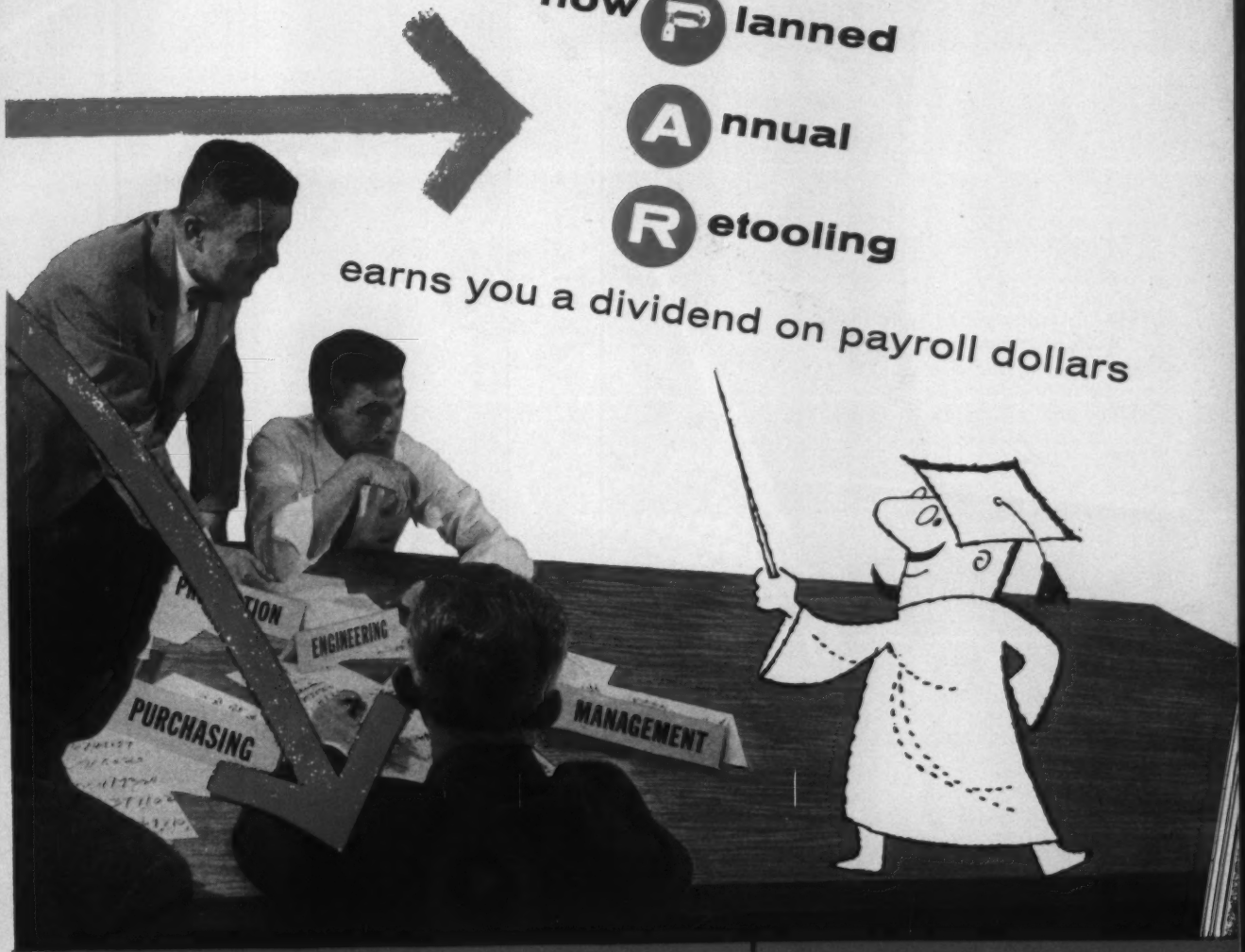
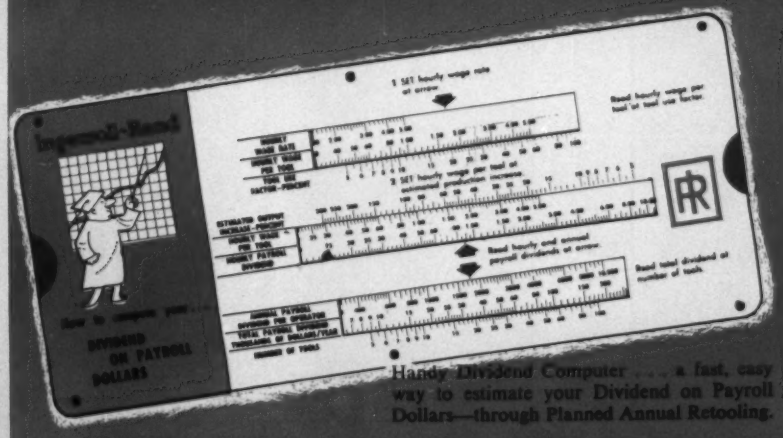
how Planned Annual Retooling earns you a dividend on payroll dollars





Handy Dividend Computer . . . a fast, easy way to estimate your Dividend on Payroll Dollars—through Planned Annual Retooling.

MAIL COUPON TODAY!

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Send a copy of new guidebook *"How Planned Annual Retooling Earns You a Dividend on Payroll Dollars"* and a *Dividend Computer* to:

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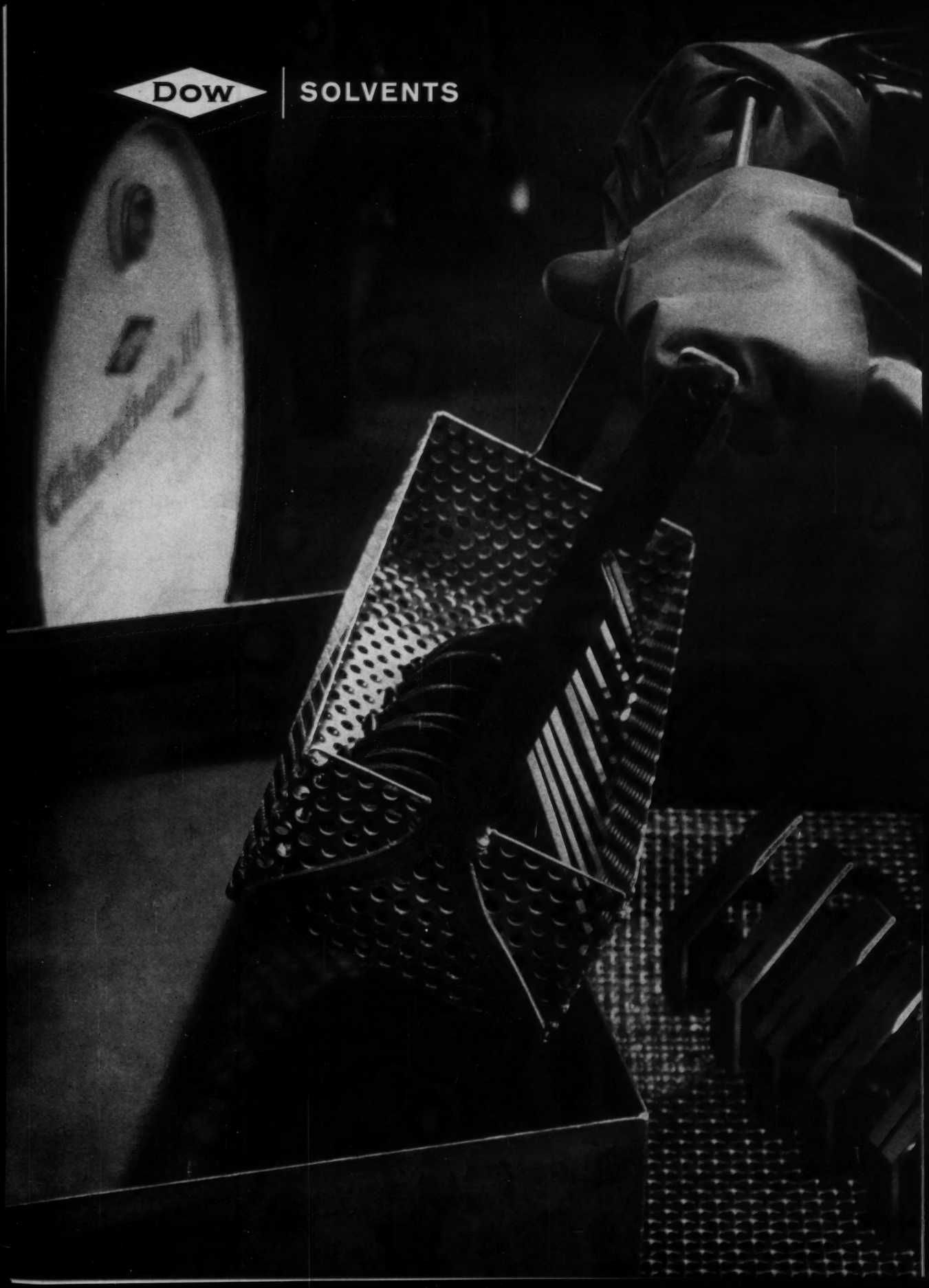

DOW
SOLVENTS

ANNOUNCING...

Chlorothene NU

New stabilizer system solves corrosion problems—makes recovery easy!

Newly developed Chlorothene® NU combines high solvency and safety with an advanced stabilizer system that makes possible an extraordinary range of cold-cleaning applications – makes recovery easy, too!

The exceptional stability of Chlorothene NU (specially inhibited 1,1,1-trichloroethane) practically eliminates corrosion of sensitive metals. You can use it for cleaning aluminum, zinc, and white-metal alloys–as well as other metals, many plastics, rubber products and other materials.

Because increased stability makes recovery easy and practical, you can enjoy the economy of using Chlorothene NU over and over again. In most cases, existing equipment, such as a trichloroethylene still, does an excellent job.

Safe two ways! Low in toxicity, Chlorothene NU has a maximum allowable vapor concentration of 500 parts per million. That's closely comparable to many flammable solvents and is substantially more favorable than most chlorinated solvents. In addition, Chlorothene NU has no fire or flash point, as measured by standard methods. These features not only make Chlorothene NU safer to use–they simplify new cleaning systems and waste disposal.

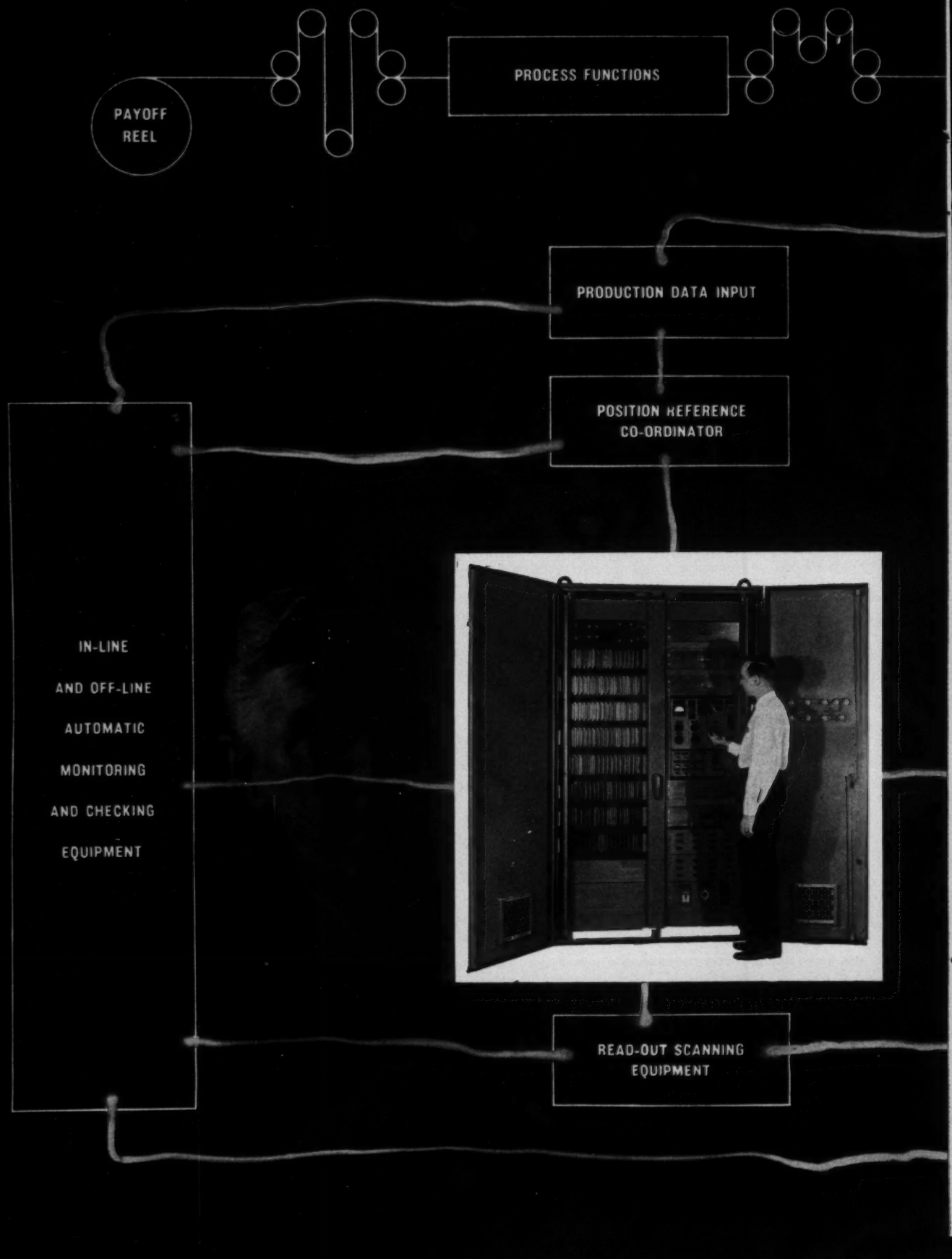
COLOR CODED–For easy identification, even from 100 feet away, drums of Chlorothene NU are distinctively color-coded in green and white. For more information about Chlorothene NU, call your distributor of Dow solvents. He knows all about its use, recovery and comparative cost. Or contact your nearest Dow sales office.

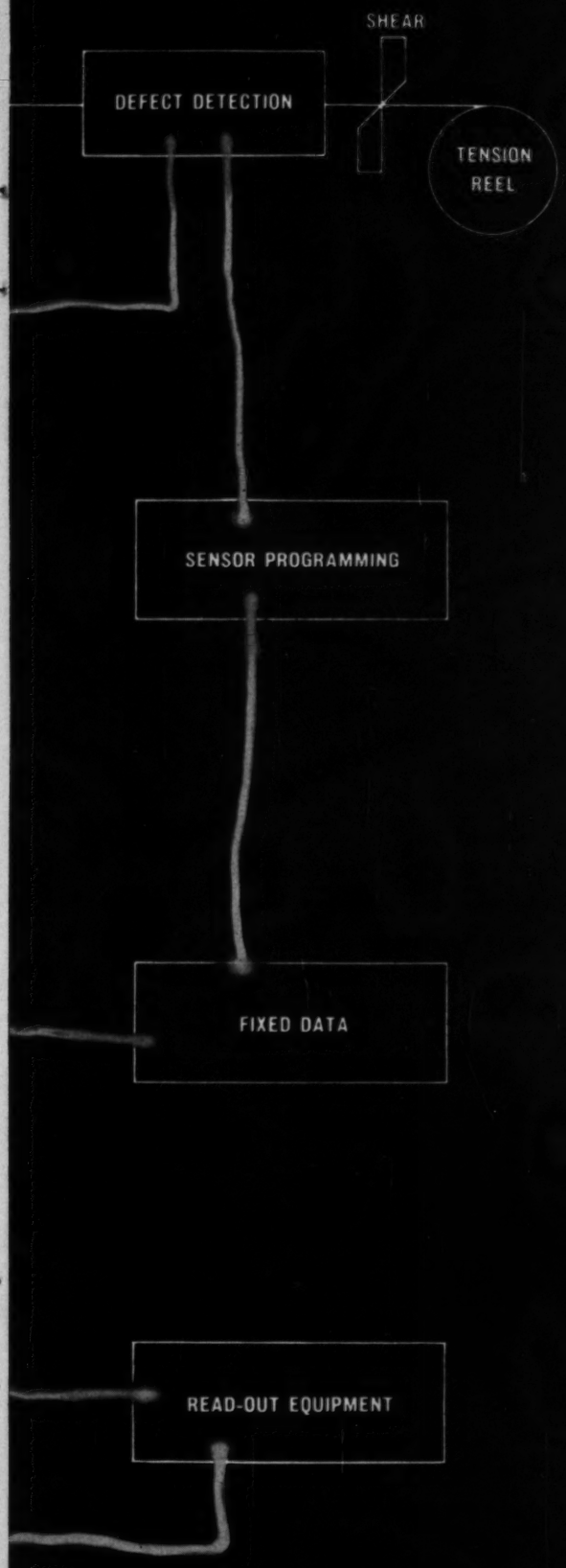
THE RIGHT SOLVENT FOR THOUSANDS OF INDUSTRIAL USES. Not only is Chlorothene NU recommended for cold-cleaning dip operations on the production line—it also cleans by spray, bucket or wipe methods. It's an all-purpose solvent for many applications, both on the production line and for maintenance use.

SEE YOUR DISTRIBUTOR OF DOW SOLVENTS FIRST!

The widest line of industrial solvents: Trichloroethylene, Perchloroethylene, Methylene Chloride, Chlorothene NU.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN DOW


PAYOFF REEL
PROCESS FUNCTIONS
PRODUCTION DATA INPUT
POSITION REFERENCE CO-ORDINATOR
IN-LINE AND OFF-LINE AUTOMATIC MONITORING AND CHECKING EQUIPMENT
READ-OUT SCANNING EQUIPMENT



NEW!

PRODAC DATA ACCUMULATOR IS VITAL LINK IN OPTIMIZING STEEL MILL PRODUCTION . . .

Another Step in Westinghouse Progressive Automation

A large eastern steel mill has found that the completely static-design Prodac* Data Accumulator is providing continuous information and read-out of the product quality of its tin mill products. This installation is providing the basic detailed data that is a prime requisite to the ultimate automatic processing line.

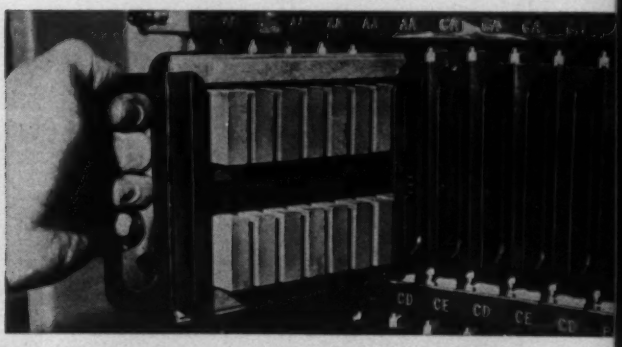
Prodac Data Accumulator Systems provide a complete record of the *product itself*. This record is a natural step in *Progressive Automation* of processing lines, rolling mills and other steel-making operations. The Data Accumulator is fully compatible with most sensing devices, electrical controls and read-out equipment.

For counsel-in-depth on steel mill drive systems application, call your Westinghouse sales engineer. He'll show you how you can economically apply step-by-step *Progressive Automation* to boost product quality, cut costs in your plant. For more information about Prodac, call Westinghouse or write: Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa. J-96147

YOU CAN BE **SURE**... IF IT'S

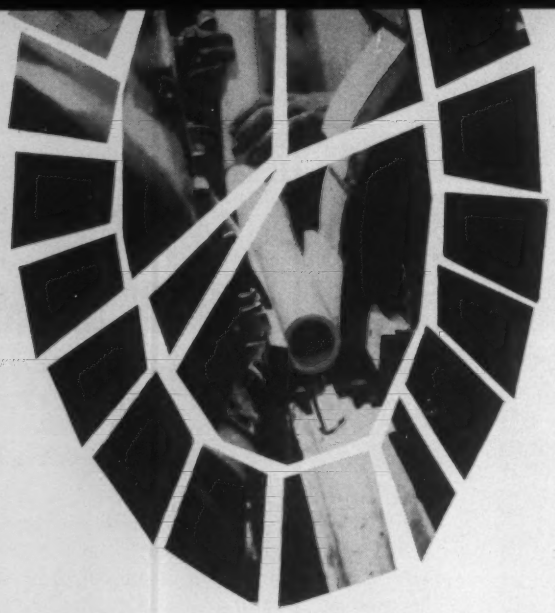
Westinghouse

TUNE IN WESTINGHOUSE-CBS TV-RADIO COVERAGE, PRESIDENTIAL CONVENTIONS, JULY 10-29



This withdrawn module represents a circuit function. It is easily accessible for removal or replacement.

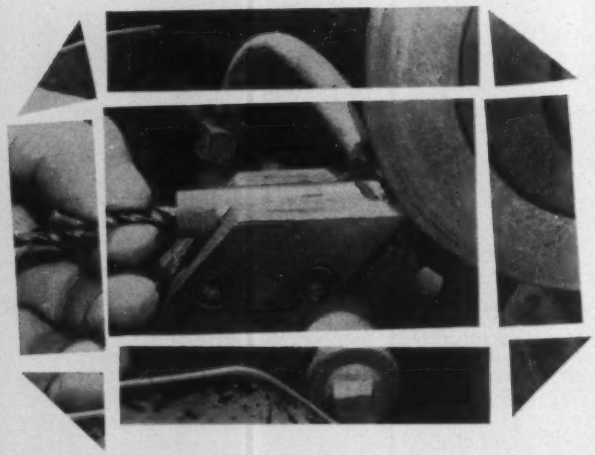
*Trade-Mark

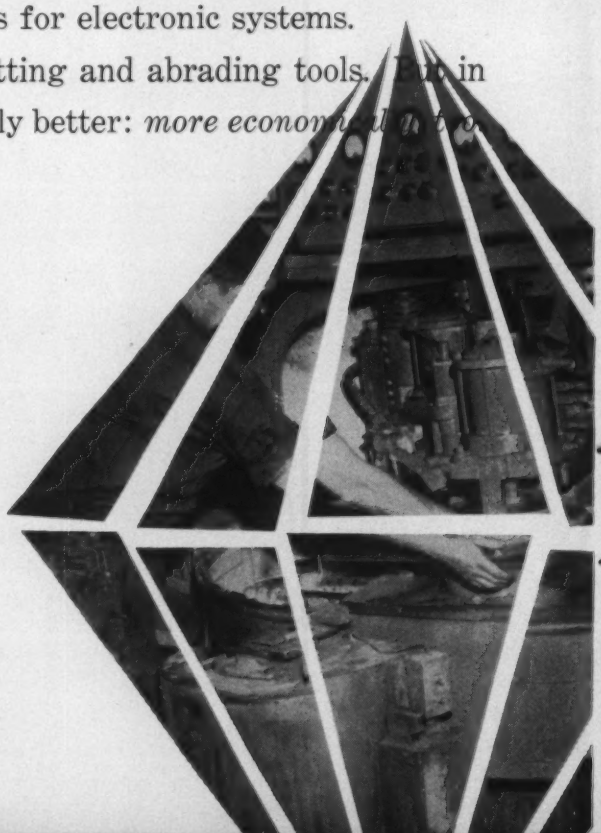


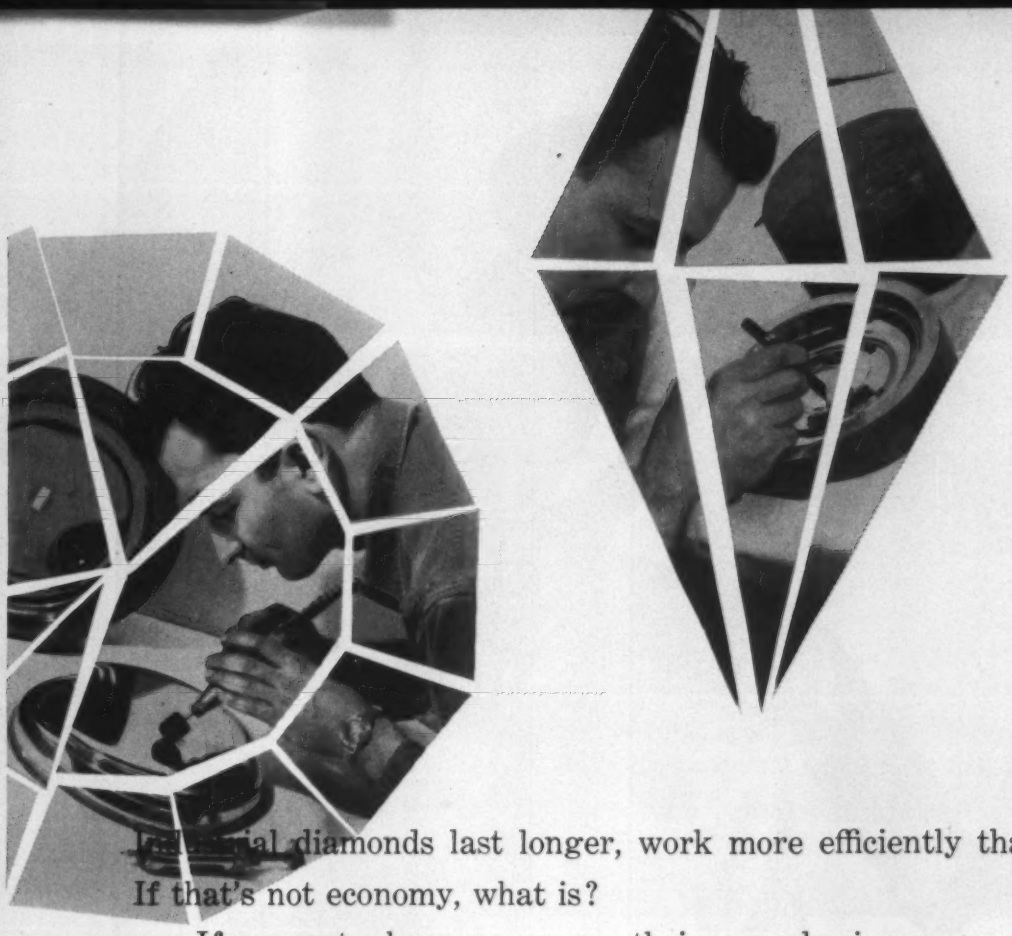
DIAMONDS AT WORK

Industrial diamonds are, first and foremost, *tools.* They're used in many ways to do many jobs. Diamonds keep hardest carbide tools sharp and efficient. Diamond wheels shave jet runways to perfect smoothness. Diamond tools speed up production of precision aluminum parts for automobiles. Diamonds machine close-tolerance ceramic components for electronic systems.

These jobs *could* be done with other cutting and abrading tools. But in every case, diamonds do them better. Not only better: *more economically.*



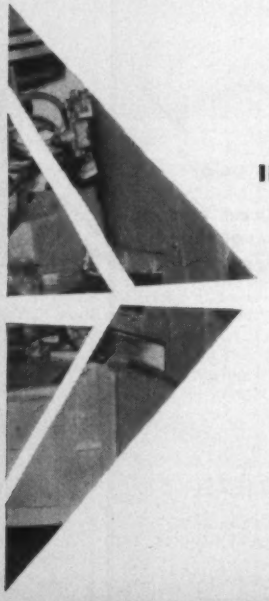




Industrial diamonds last longer, work more efficiently than anything else. If that's not economy, what is?

If you cut, sharpen, or smooth in your business, you can probably use diamonds to advantage. Wide assortments are available in any quantity to your diamond wheel and tool maker. See him for more information.

INDUSTRIAL DISTRIBUTORS (SALES), LTD.



INDUSTRIAL DIAMONDS CUT PRACTICALLY EVERYTHING . . . ESPECIALLY YOUR PRODUCTION COSTS

Industrial Distributors (Sales), Ltd., is the world distributor of natural industrial diamonds . . . the most efficient cutting, polishing and abrading substance known to man. Industrial Distributors sponsors the Diamond Research Laboratory. Its work is devoted exclusively to investigations on all phases of the diamond. The Laboratory stands ready to offer information and assistance to all users of industrial diamonds. Please address your inquiries to: The Diamond Research Laboratory, P.O. Box 104, Crown Mines, Johannesburg, Union of South Africa.

How Greenlee Bros., Rockford, Ill., Saved $19,600 in 12 Months with An AO Protection Program

GREENLEE BROTHERS, ROCKFORD, ILLINOIS installed a complete compulsory eye protection program in 1959. The investment quickly paid off in dollars and cents as well as bettered morale, pain-prevented, sight savings, skills protected. And remember, most of the first year's cost of $14,237 is non-recurrent.

VITAL STATISTICS

- 64% reduction in workers making trip to nurse.
- 51% reduction in workers making trip to doctor.
- 90% reduction in lost time hours due to serious eye accidents.
- 3 Eyes Saved*

*Actually 11 eyes, but 8 of the accidents occurred in the foundries. These were previously covered.

- $19,600 estimated savings.

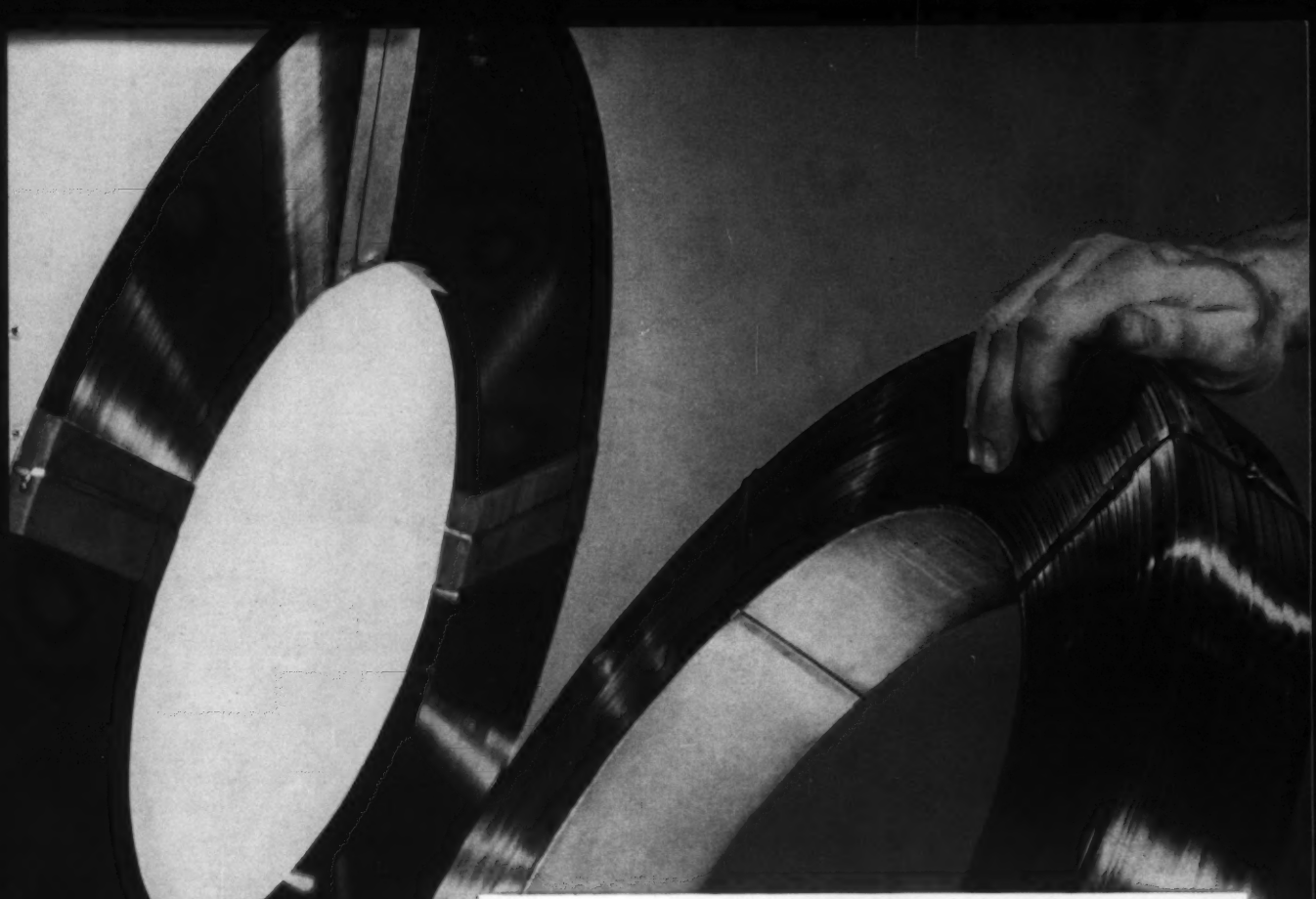
What plant investment pays off as rapidly? Send for new brochure, "Eyes Are Expensive Targets".

American Optical COMPANY
SAFETY PRODUCTS DIVISION
Southbridge, Massachusetts

Safety Service Centers in Principal Cities

Always insist on AO Trademarked Safety Products

Your Surest Protection . . . AO SURE-GUARD Products



Speaking of Records

. . . *our* records show that when a manufacturer once discovers the exceptional and uniform quality of Roebling flat spring steel, he becomes a permanent Roebling customer.

Your records for faster production and lower costs can be improved, in large measure, by Roebling's strict attention to supplying you with the finest flat spring steel available. When you need flat spring steel, specify Roebling. Write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey, for complete details.

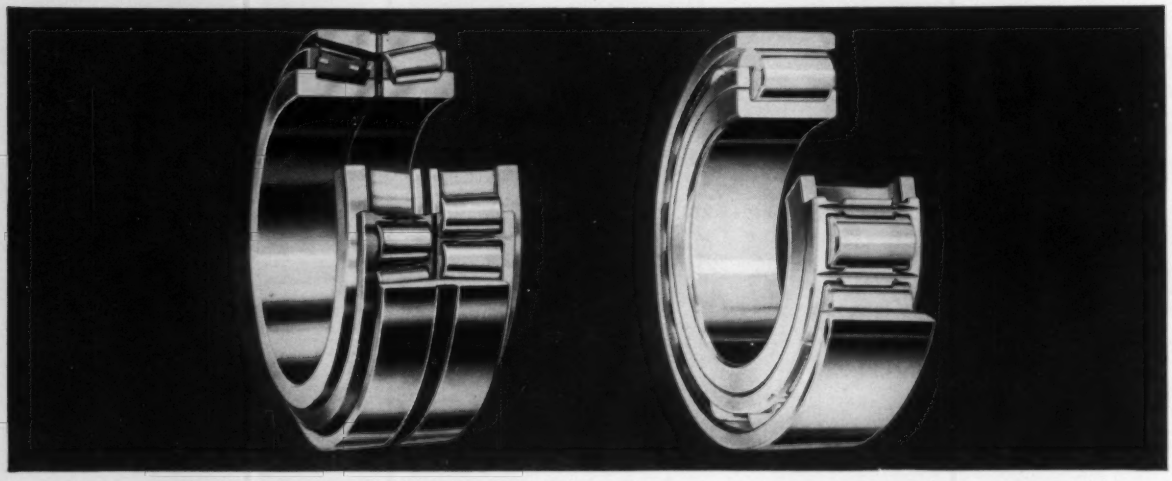
These are typical of the many types of quality parts produced from Roebling flat spring steel.

ROEBLING

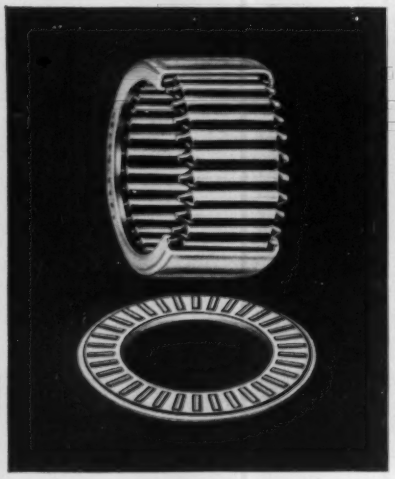
Branch Offices in Principal Cities
John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

Roebling . . . Your Product is Better for it

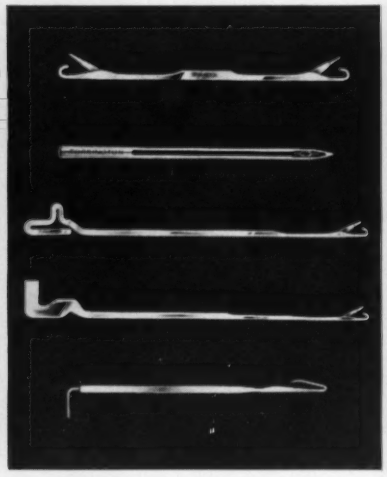
YES, TORRINGTON IS A LEADER IN THE PRODUCTION OF TAPERED AND RADIAL ROLLER BEARINGS...



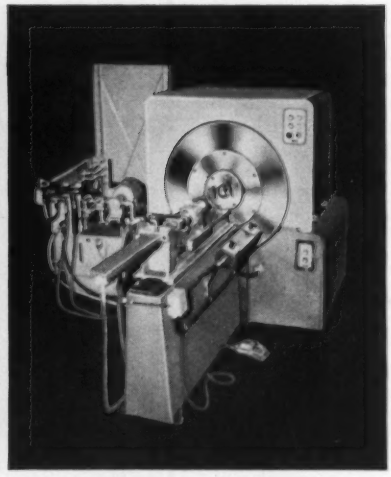
BUT THIS, TOO, IS TORRINGTON...



Pioneer maker of the revolutionary needle bearing and needle thrust bearing, widely used in a variety of products including jets, missiles and rockets where space is at a premium.



Since 1866 America's largest producer of precision-made machine needles for every need—knitting, sewing, tufting, felting—and a leading manufacturer of surgeons needles.



World's largest manufacturer of rotary swaging machines for fast, economical chipless machining in the production of metal parts for thousands of uses throughout industry.

In these and many other fields throughout the world Torrington is contributing to

PROGRESS THROUGH PRECISION

THE TORRINGTON COMPANY

Torrington, Connecticut

Serving industry from plants located in the United States, Canada, England, Germany and Italy

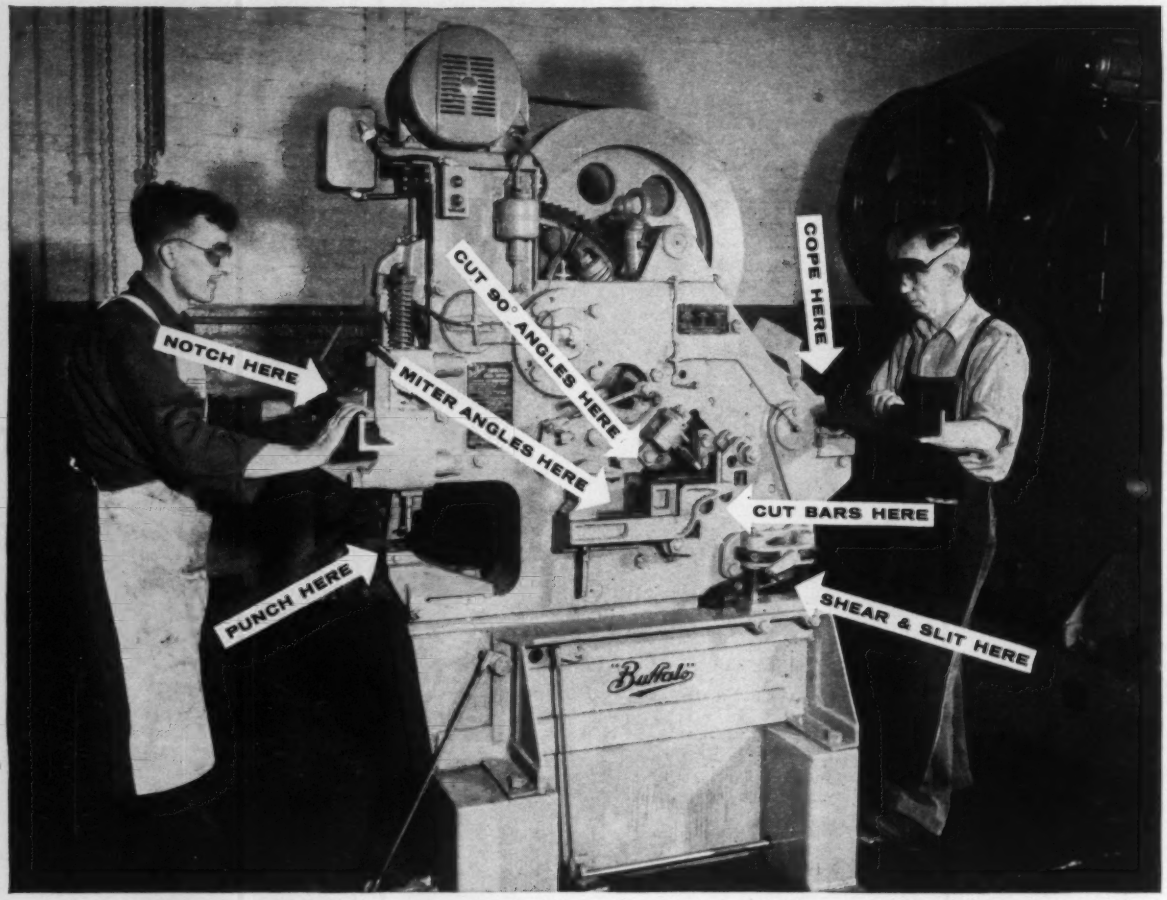
STEEL BAR

STEEL bar is a white hot stream of molten metal shooting from a furnace. A steel billet squeezed by giant rollers to precise shapes. Youngstown hot rolls and cold draws rounds, squares, flats and hexes . . . angles, channels, tees and zees, Youngstown special quality bar to specifications. And, when strength with ease of machinability are desired, choose Yolead leaded steel. Over 800 different kinds of carbon, alloy and Yoloy steel bar products come from Youngstown, a growing force in steel.

YOUNGSTOWN STEEL bar is the axle shaft on your car. A nut. A bolt. A staple. It is a polished hydraulic lifting arm, a pin in a tractor tread. It is a mat of reinforcing bars. A length of wire rope. From mine to open hearth to bar mill cut lengths and coils, Youngstown steel bar is tested, retested and delivered to you on time. You can get it from your steel warehouse or through 28 Youngstown Offices. Whatever your needs for quality bar, rod and wire, depend on Youngstown, a growing force in steel.

Youngstown – growing force in steel

THE YOUNGSTOWN SHEET AND TUBE COMPANY, YOUNGSTOWN, OHIO. ATLANTA BOSTON BUFFALO CHICAGO CINCINNATI CLEVELAND COLUMBUS DALLAS DENVER DES MOINES DETROIT GRAND RAPIDS HOUSTON INDIANAPOLIS KANSAS CITY LOS ANGELES MILWAUKEE MINNEAPOLIS NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS SAN FRANCISCO SEATTLE TULSA WASHINGTON



SEVEN OPERATIONS—SAME MACHINE

SAVES ON MAINTENANCE AND PRODUCTION

A BUFFALO Iron Worker can be the most useful, productive and cost-saving machine in your shop.

Without changing tools, it will do a variety of jobs — **several at the same time.**

It's compact, ruggedly-built, requires practically no maintenance and is available in your choice of sizes and models.

Worth investigating, a BUFFALO U. I. W. pays its own way and returns dividends. Maybe you can't afford to be without one. Write for Bulletin 322 or . . . better still . . . call in your nearest BUFFALO representative.

See 'Buffalo' Machine Tools in Action at Machine Tool Exposition . . . Booth 551

"Buffalo"

BUFFALO FORGE COMPANY

Buffalo, New York

Buffalo air handling equipment to move, heat, cool, dehumidify and clean air and other gases.

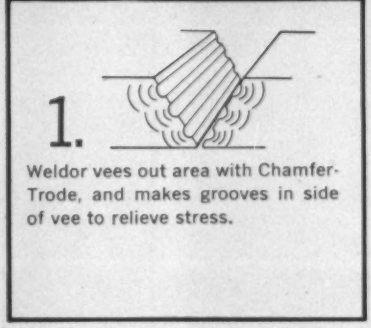
Buffalo Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.

Buffalo Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.

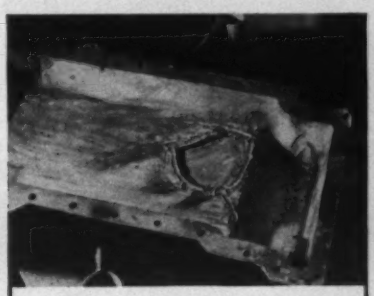
Squier machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

You're better off with Buffalo Machine Tools to Drill, Punch, Shear or Bend.

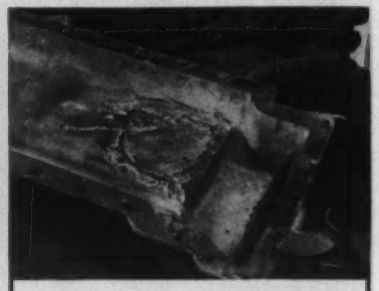
NEVER SAY "CAN'T WELD IT"... Case in point: Midwest shop was given a broken cast iron oil sump to repair. Conventional weld attempts failed due to oil and crack-sensitivity. Porosity and voids resulted. Then they called in Eutectic. Our man-on-the-spot prescribed the cure: our trouble-shooting trio of ChamferTrode®, EutecTrode® 27, and QuenchTrode* 24. Watch them!

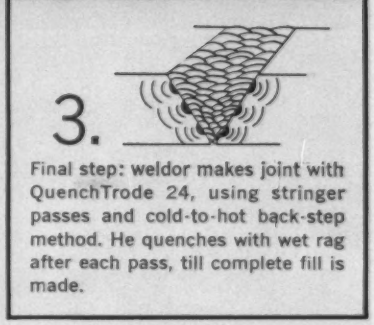


1. Weldor vees out area with ChamferTrode, and makes grooves in side of vee to relieve stress.



2. Now he "paints" over entire vee surface with EutecTrode 27, filling grooves as he goes. EutecTrode 27 bonds to the oiliest surface, gives base for joining.





3. Final step: weldor makes joint with QuenchTrode 24, using stringer passes and cold-to-hot back-step method. He quenches with wet rag after each pass, till complete fill is made.

RESULT: A strong, permanent, machinable weld, in a fraction of the usual time. No distortion, stress, or cracking. NOTE: the "Quench Weld" process is equally effective for building up missing metal sections or joining steel to cast iron. This is but one example of how Eutectic helps you.

For the finest in quality products, always turn to Eutectic. Service, on the job, any time, anywhere.

O.K., Eutectic, Prove It!
I want a demonstration of the Quench Weld Process.

Name .....
Company .....
Address .....
My title .....

*Patent Pending ® Reg. T.M. Eutectic Welding Alloys Corp.

For Innovation: EUTECTIC WELDING ALLOYS

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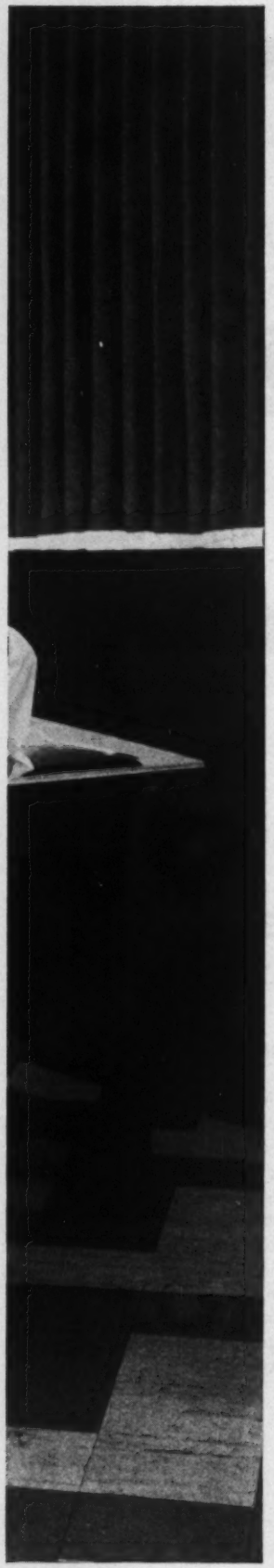
EUTECTIC WELDING ALLOYS CORPORATION

THE AMPLEXOLOGIST



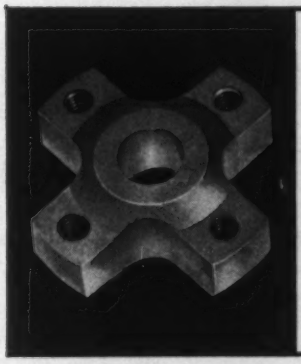
The Amplexologist has a high regard for prospective customers' blueprints. He finds it necessary upon occasion, however, to put them respectfully aside. Especially when he's told: "We tried to make this part out of powder metal a couple of years ago but the supplier couldn't meet our specs."

The Amplexologist, you see, has heard this song before. That's why he puts down the prints and picks up the part. And starts probing.

What does this part have to do? Under what conditions? Any special strains? Impact? Where? What about the configuration? Is this contour functional? Are these sharp angles necessary?

Often as not, the answers to these questions hit pay dirt. They usually reveal, in fact, that with a little redesigning another "impossible" part can, after all, be made better and cheaper through advanced powder metallurgy (i.e. Amplexology).

We're happy to say that most manufacturers are eager to eat their own specifications anytime they can save thousands of dollars and still maintain (or improve) quality. Their willing appetite has helped make us the world's largest and most experienced producer of powder metal parts. One more reason why manufacturers say, **When it comes to powder metallurgy—Amplex has the answer.**



A LITTLE RE-DESIGNING . . .

The part shown is an engine fan-pulley hub. It was formerly a solid circular casting. The manufacturer had to machine the face, bore the ID, drill and tap four holes. The Amplexologist re-designed the hub into its present cloverleaf shape—to reduce weight and cost of material. It is now being produced by powder metallurgy as a finished precision part that requires no machining—except tapping the holes. Total savings about 33%.

AMPLEXOLOGIST

SEND COUPON **. . . if you'd like to talk over your product with the Amplexologist. Don't hesitate. He's always happy to get out of the office.**

AMPLEX DIVISION • CHRYSLER CORP. • Dept. I-7
P.O. Box 2718 • DETROIT 31, MICH.

Please have the Amplexologist call to look into the possibility of using powder metal parts in our product.

NAME_____

COMPANY_____

ADDRESS_____

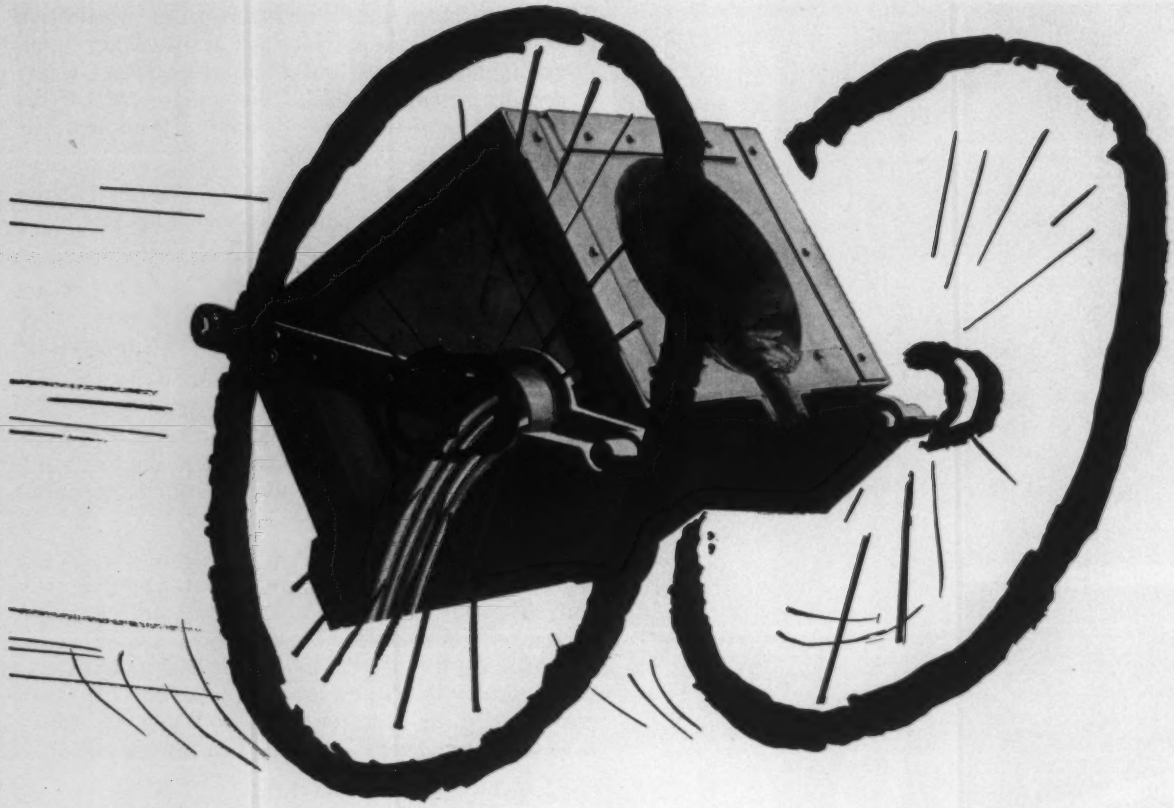
CITY_____ STATE_____

PRODUCT_____

AMPLEX

DIVISION CHRYSLER CORP.

A CHRYSLER OILITE® PRODUCT



WHY INDUCTION MELTING IS ON THE MOVE AGAIN

Take the basic advantages of induction melting.

Add improvements that save time, cut costs, and increase service life.

That's what Inductotherm has been doing for the past seven years. The result is a new style of induction melting that's far more flexible, far more useful, far more desirable.

For example, Inductotherm introduced the first fully assembled control cubicle that combined all capacitors, controls, and safety devices in one pre-tested unit. And Inductotherm was first also with the Inducto "Integral" series, packaging the motor-generator set *in the control console.*

Inductotherm cut the cost of power and of pit construction by feeding leads through the trunions of tilting furnaces. And service life has been lengthened . . . maintenance reduced through the use of rigid, Heliarc welded furnace construction.

New Inductotherm ideas have induction melting on the move

The biggest innovation in induction melting has been the Inductotherm concept of service. Not just fast repairs and overnight replacement of parts (even M-G sets) . . . but a basic concept: *Inductotherm is out to fit induction melting to your needs.* We will make every effort to improve our equipment and the induction technique, never asking you to trim your needs to the limitations of our equipment.

If you'd like more information on Inductotherm furnaces, write for Bulletin 70. But, for a taste of Inductotherm service, ask to have an engineer call. Inductotherm Corporation, 412 Illinois Ave., Delanco, N. J.

INDUCTOTHERM

BACKLOGS OF UNFILLED ORDERS FOR DURABLES declined in May. The big reason was the decline in steel, now scraping bottom. New orders did increase during the month, from $14.5 billion to $14.6 billion. Shipments (sales) rose from $15 billion in April to $15.1 billion in May.

FULL SPEED AHEAD IS SIGNAL FOR U. S. HIGHWAY BUILDING program in new fiscal year. Despite warnings of financial difficulties, the Federal government will have almost $3 billion available for payment of its 90 pct share of interstate highways. This is about $170 million more than in fiscal 1960.

PURCHASING EXECUTIVES ARE CONTINUING TO BE VERY CAUTIOUS. Nor are they making extensive forward commitments. This is the word from the National Association of Purchasing Agents. There are signs that forward commitments are of a shorter duration than at any time since the 1957-58 recession.

MANY OVERSEAS MARKETS CONTINUE RIPE FOR U. S. PICKING. Examples: At least 12 French firms are looking for U. S. licenses to make American products. Facilities are offered for metal stampings, shipbuilding, agricultural equipment and electronic equipment. And Australia is looking for used machine tools. In many cases, machine tools may be imported duty-free into Australia.

ELECTRIC HEATING EQUIPMENT IS DUE FOR RECORD YEAR, according to the Commerce Dept. Although data on shipments is lacking for years prior to 1959, that year's shipments of $27.9 million are felt to be the present high. The department looks for expanded sales based on increased promotional activity and lower electric rates for heating.

EXPORTS CONTINUE RISE OVER LAST YEAR'S SHOWING. Exports, excluding military shipments, are estimated at $1,670 million for May compared to $1,411 million for May, 1959. The Census Bureau's estimate of exports for the first five months of 1960 is $7,994 million, up about 21 pct over the $6,597 million reported during the corresponding period of 1959.

STEEL DRUM AND PAIL INDUSTRY LOOKS FOR SOLID YEAR. Shipments are expected to exceed the 1959 volume of $295 million. The industry bought almost 800,000 tons of finished steel products in 1959.

Furniture Manufacturers Call it

"BRIDGEPORT FREE-ER MACHINING BRASS ROD"

Manufacturers of a wide variety of products find Bridgeport Free Machining Brass Rod eminently suited to their items—from both a production and beauty point of view. Furniture manufacturers are but one successful example.

The production steps involved in manufacturing such furniture are frequently numerous and complex. For example, a solid brass tea cart such as shown here may represent some ten or more separate production steps. These include cutting, bending, drilling, tapping, twisting, polishing and lacquering, most of which are done on high-speed automatic equipment. The objective here, as with any screw machine operation, is high *uninterrupted* speeds. An increasing number of manufacturers are achieving these uninterrupted speeds with Bridgeport rod and tubing of various shapes and sizes. They find, on a comparative basis, that the high quality of Bridgeport Free Machining Brass is *constant* and can be depended on from end to end.

Bridgeport Free Machining Brass is but one of the many "easy-does-it" metals that are standard stock and immediately available from nearby Bridgeport Warehouses. An inquiry to your local Bridgeport Sales Office may lead to improving your product, increasing your production rate and raising your profits. Call today!

(Dept. 3403)

BRIDGEPORT BRASS COMPANY

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Specialists in Metals from Aluminum to Zirconium

Are Job Patterns Undergoing Period of Major Evolution?

Shifting patterns of employment and technological progress create employment problems.

They'll have to be worked out by labor as well as management.—By G. J. McManus.

■ Are new measures needed to deal with industrial unemployment?

Two developments may soon force wide consideration of this question:

First, labor is making a strong push for a shorter work week.

Second, management faces a period of shifting job patterns with a work force that is being frozen tightly in place.

Focal point for both developments is the steel industry. With mills shutting down or cutting back sharply, steel's union is renewing the cry for a shorter work week.

Seek New Law—"We intend to ask the Congress . . . to enact a new Fair Labor Standard Law reducing the work week to compensate for the fast rush of automation," says David J. McDonald, president, United Steelworkers of America.

"If Congress does not act promptly," adds Mr. McDonald, "the United Steelworkers of America will have no alternative but to press for the four day week in our next contract negotiations."

With automation, argues the union, mills can produce far more steel than can be sold; steel is becoming a nine-month industry. Unless productivity is offset by reduced work hours, unemployment will weaken the whole economy.

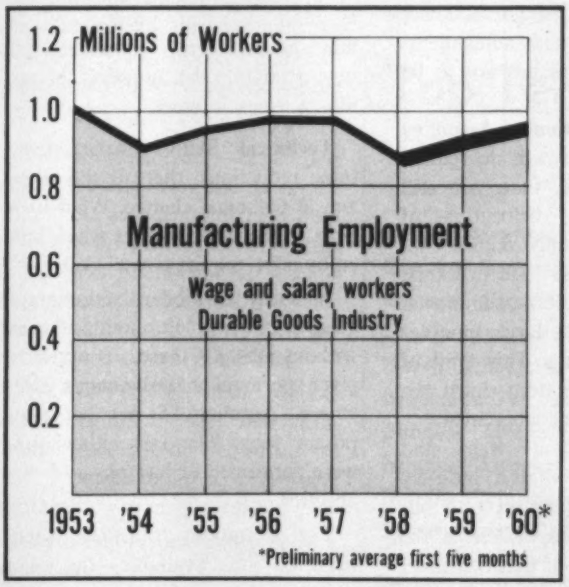
Pro and Con—"You must either shorten hours or have the employed portion of the labor force support a growing percentage of unemployed," says Marvin J. Miller, as-

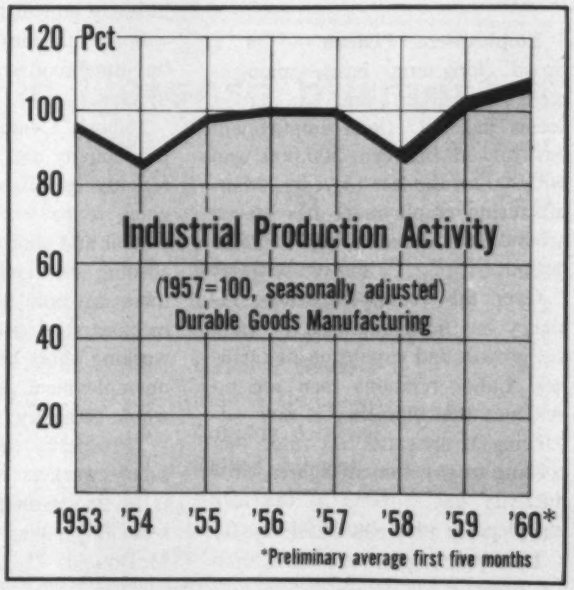
What's Coming In Labor?

This is the second of an IRON AGE series on labor.

Next week, editor-in-chief Tom Campbell analyzes the issues that still remain unsolved in steel labor, with a look ahead to the next negotiations.

Output Is Rising Faster Than Employment





How Employment Pattern Changed

Comparing Two Steel Recessions

	1937-38	1957-58
Ingot Rate	Dropped 45.4 Pct	Dropped 39.5 Pct
Average Yearly Employment	Dropped 29.4 Pct	Dropped 19.2 Pct
Employees Earning Wages	Dropped 2.6 Pct	Dropped 4.1 Pct
Employees Earning Salaries	Gained 22 Pct	Gained 17.4 Pct
Total Hours Worked	Dropped 64.8 Pct	Dropped 24.5 Pct

sociate research director of the Steelworkers.

Top industrial relations men for the steel industry dismiss the specific union proposal in a matter-of-fact way. They contend steel employment has been remarkably stable on a long-term basis; it has not been shown that drastic measures are needed at this time.

When and if the need for a shorter week is demonstrated, says management, labor will have to recognize it costs money to reduce hours. This cost must be related to ability to pay and to total benefits received.

Employment Plateau — On a broad, long-term basis, management's position on automation seems justified. Steel employment has ranged between 500,000 and 600,000 for the last 15 years. Manufacturing employment has stayed around 16 million during the same period.

Over the years, increased efficiency has been balanced by market growth and expansion of facilities. Labor relations men see no evidence that efficiency is now advancing at an extra fast rate. According to government figures, productivity has climbed at the rate of 3.4 pct a year since 1947.

Last year's gain was more than 4 pct. However, this was a recovery period; 1955 also produced big gains. Preliminary estimates for 1960 call for a more modest improvement.

Must Go Up—The matter of market growth appears a more serious concern. Steel, automotive and appliance industries have never regained 1955 peaks. Steel consumption has not increased materially since 1955. Average employment of 650,000 in 1953 is still a record for steel.

However, steelmakers point to population projections. They insist industry growth is inevitable. There will be plateaus and adjustments but the broad trend has got to be upward.

Labor's Contention — Assuming productivity and growth do remain roughly in balance, there are still going to be severe dislocations of a local and short-range nature. According to United Steelworkers, there are now 85,000 unemployed in basic steel and a larger number working short hours. This kind of unemployment can drag down the whole economy, say labor men.

"Prosperity for all wage and salary workers is vital if industry is to find growing markets to absorb its growing output," says Mr. McDonald. "Loss of that consumer buying power through unemployment, however induced, hits the pocketbook of everybody in the country."

Economic Impact — While this general thesis can't be disputed, there are signs that industrial layoffs are having less and less impact on the economy. In May of this year, factory employment dropped by 45,000. In the same month, overall employment rose by 1 million; unemployment fell by 200,000. Net spendable earnings rose 70¢ or 1 pct.

In the steel center around Pittsburgh, May showed a drop of 2200 in primary metals employment. But overall Pittsburgh employment rose 1800. Summer statistics may show steel putting a deeper dent in the economy. However, 43 pct of the work force is now in service or government jobs. Industrial swings have less tendency to rock the nation.

Seniority Muddle—These swings present major problems for companies and individuals. Work specialization, fringe benefits and jobless pay all tend to reduce the mobility of the work force.

Seniority rules complicate things. One aspect of this problem involves fair distribution of available jobs. In layoff periods, how do you protect veteran employees and still maintain efficient production? A labor-management committee is now studying the question of seniority rules in steel.

Technical Skills — Apart from force reductions, there is the problem of technical change. What happens to the older worker when new equipment requires new skills?

Recently a modernization program at one mill left about 150 men without jobs. Of these, 70 pct were given permanent assignments elsewhere. Another 15 pct got temporary jobs. The rest either quit, were pensioned or had physical disabilities.

For a smooth transition, there must be jobs available—the right

kind of jobs. The nature of technical change is a consideration here. On things like electronic controls, there is the question of whether maintenance men should come from management or be part of the bargaining unit.

Training Programs?—The general union position is that displaced crews should be put on new equipment until they have been shown unqualified by on-the-job training.

If some way could be found to match skills and pay levels with available jobs, the problem of technical dislocation might be eased. Labor turnover rates indicate new jobs are opening up fast enough to offset productivity gains, even in a static market situation. In primary metals, the hiring rate was 3.5 pct last year. It has run over 2 pct for every year but one in the last 10.

Security Conscious — The new steel contract may increase the retirement rate. The provision of three weeks terminal pay is considered an inducement for older workers to call it a day. Better than 65,000, or 15 pct, have more than 25 years service.

Apart from internal job distribution, industry faces the problem of unemployed workers. In recent years, the trend has been to strengthen the financial ties between companies and their jobless groups. The steel industry payed out around $50 million in Supplemental Unemployment Benefit checks before the 1958 slump began to ease.

Welfare Agencies? — The new Social Security Act increases the Federal tax for unemployment from 0.3 pct to 0.4 pct. Labor is pushing for a further liberalizing of benefits. Management is resigned to some form of jobless aid but it feels the line must be drawn somewhere.

"We don't feel we should become welfare agencies," says one steelmaker. "But we do recognize we have a responsibility to give some assistance to men laid off."

Where this responsibility ends is a question.

Aerospace Climbs On Defense List

Dept. of Defense prime contract awards for 1959 were fairly well balanced among the top 100 companies.

Many familiar names were on the list of the top 10. Subcontractors benefited this year.

■ As was expected, the electronics and aerospace industries reaped the major portion of nearly $22 million spent through Federal military prime contract awards in 1959.

Figures released by the Dept. of Defense revealed only minor changes from 1958. Among the 100 companies that divided more than 73 pct of the total prime contract funds, 24 from last year's list disappeared.

The list of the top ten contained many familiar names for recent years, with a slight change in standings (see table below).

On and Off—Two companies specializing in aircraft, missile and electronics programs were added to the "100" list this year. Three additional construction firms and one more ammunition and chemical company were put on. Petroleum and service companies dropped.

A large portion of the prime contract dollar is subcontracted. Of the 100 firms listed in the 1959 figures, 90 pct of the total awards were subcontracted to smaller organizations.

General Dynamics Corp., producer of nuclear submarines, led in total awards during the last calendar year. Boeing Airplane Co., on the top of the list in 1958, dropped to second place.

Other companies to gain significantly from the government awards in 1959 included Grumman Aircraft and Engineering Corp., Avco Corp., and Thiokol Corp. Grumman advanced from 47th place in 1958 to 12th last year.

Among the first 25 on the 1958 list that dropped below this point in 1959 were Chrysler Corp., Republic Aviation Corp., Northrop Corp., and Curtiss-Wright.

Top Ten in Defense Business

1958	Percent of U. S. Total	1959	Percent of U. S. Total
Boeing Airplane	8.0	General Dynamics	6.9
General Dynamics	6.5	Boeing Airplane	5.4
General Electric	4.0	Lockheed Aircraft	4.3
Lockheed Aircraft	3.9	North American Aviation	4.3
North American Aviation	3.8	General Electric	4.2
American Tel and Tel	3.3	Martin Company	2.7
Douglas Aircraft	2.8	Douglas Aircraft	2.5
Hughes Aircraft	2.4	United Aircraft	2.4
Martin Company	1.9	American Tel and Tel	2.3
Sperry Rand Corp.	1.8	McDonnell Aircraft	1.8

May Steel Exports Top Imports

This Was the First Time It Happened in 17 Months

Steel exports surpassed imports in May for the first time in 17 months.

If trend continues, this could be best year for steel exporters since 1957.

▪ For the first time in 17 months, exports of steel mill products have topped imports.

Foreign trade in steel mill products reversed itself in May. The U. S. Dept. of Commerce reported that May exports rose to 320,000 net tons, while imports dropped to 272,000 tons.

The export figure was the highest since January, 1958.

Pattern Traced — Imports began their continuous topping of exports in November, 1958. Then, last summer, the steel strike brought exports toppling.

Following the strike settlement, steel exports began to creep up on imports. But it wasn't until May that the reversal became a fact.

If exports continue at the May level, total exports this year will exceed 3 million tons. This would make 1960 the best year since 1957.

May exports were 85,000 tons above April and 137,000 tons over exports in May, 1959.

Sheet Sales Important — Cold-rolled sheets played the biggest part in the export increase, accounting for 55,000 tons of the total 85,000 ton rise in May.

Shipments of hot-rolled sheets, semi-finished steel (ingots, blooms, billets, and slabs) tin mill products and rails also increased.

Exports for the first five months of this year totaled 1.1 million tons, compared with 1.3 million tons in the same period of 1958 and 900,000 tons in 1959.

Imports have also been in a trend —downward.

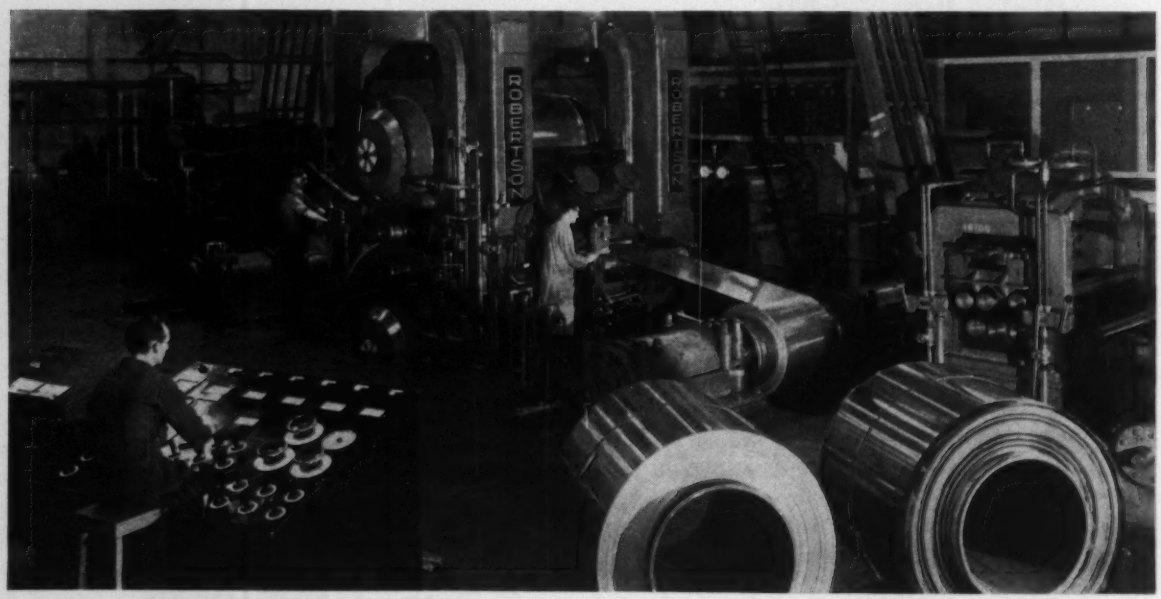
The 272,000 tons of May were 59,000 tons below April and 113,000 tons below May, 1959.

Where Imports Dropped—Sheets accounted for 29,000 tons of the 59,000-ton decline in May. Wire rods, structural shapes and plates were also down. Concrete reinforcing bars, steel pipe, and tubing recorded small increases.

Steel mill product imports for the first five months this year totaled 2 million tons. This was 1.5 million tons above 1958 and 500,000 tons more than 1959.

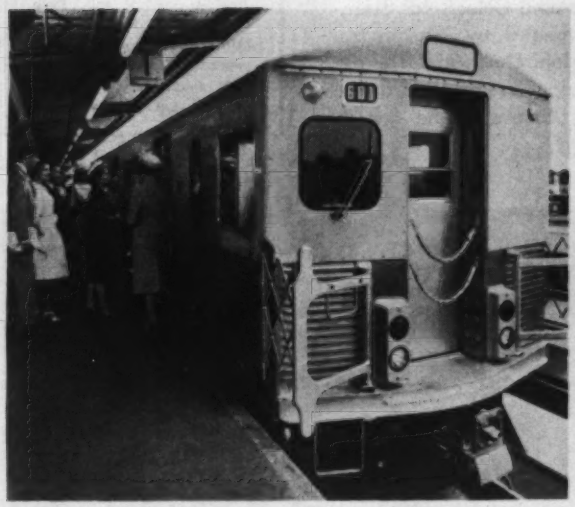
For the first five months imports accounted for 5.3 pct of the total new supply of steel available in the U. S. The import share of new steel supplies was only 3.9 pct for the first five months of 1959.

But if imports continue at the present reduced level, the 1960 total will be 3.9 million tons. In the strike year of 1959 imports reached a peak of 4.4 million tons.



NOT ENOUGH: Despite automation equipment, such as this cold-rolled strip mill in Great Britain, European manufacturers, especially automakers, must import large tonnages of sheet and strip products.

New Fare for Philadelphia Commuters



PLEASANT TRIP: Commuters board one of the 270 new cars being built by the Budd Co. They will replace 313 old vintage cars. Lightweight construction cuts seven minutes from running time. A Budd-built ventilating system assures comfortable riding at all temperatures.

IN THE WET: New, stainless steel rapid transit cars destined for the Philadelphia Subway-Elevated system are water tested at the Budd Co.'s Red Lion Plant. Cars contain 9000 lb of stainless in structure and siding. They weigh 12 pct less than average subway cars and will result in a 12 pct power saving, officials say.

Armco Steel Plant Gets Overhaul

Armco Steel Corp.'s Middletown, O., Works last week underwent a $1 million overhaul. It was the largest concentrated repair job in the plant's history.

About 4000 Armco workers were employed last week completing more than 150 major repair projects. The remaining 1150 men who make up the plant's normal work complement were on a 7-day paid vacation.

Clyde G. Davies, vice president and general manager of the company's Armco Div., says the repairs are being done in anticipation of the production pickup expected later in the year.

He says few of the projects could have been done when the plant was in full production.

Fiscal Surplus Is Possible

As far back as last January the President proposed a $79.8 billion budget with a $4.2 billion surplus. The surplus now looks more like $3 billion and maybe less if revenues don't reach expectations. Treasury Dept. experts say nothing has happened to make them change their forecast of $84 billion in revenues.

Eisenhower Optimistic

Concern being expressed by some economists over the chance of a new recession is not shared by President Eisenhower.

The President is optimistic about the nation's economy. But he admits present steel activity does cloud the picture.

"That (steel) is the only thing I know on the horizon that gives legitimate cause for the concern these people express," the President said.

He feels the economists are basing their prediction on the steel industry's present 50 pct of capacity operations. He points out that the 50 pct rate today produces as much steel as 75 pct capacity did a few years ago.

De Soto Stays

Speculation on whether or not Chrysler Corp. will continue to market a medium-price De Soto line has been a favorite Detroit pastime the last few summers. This year is no exception. In fact with the De Soto output down to a first half 1960 total of 15,805 cars from 31,132 a year ago, the subject has become even more fascinating.

This week, in a memorandum to automotive editors, Sam Petok, public relations director of Plymouth-De Soto-Valiant Div., set things straight—for the time being.

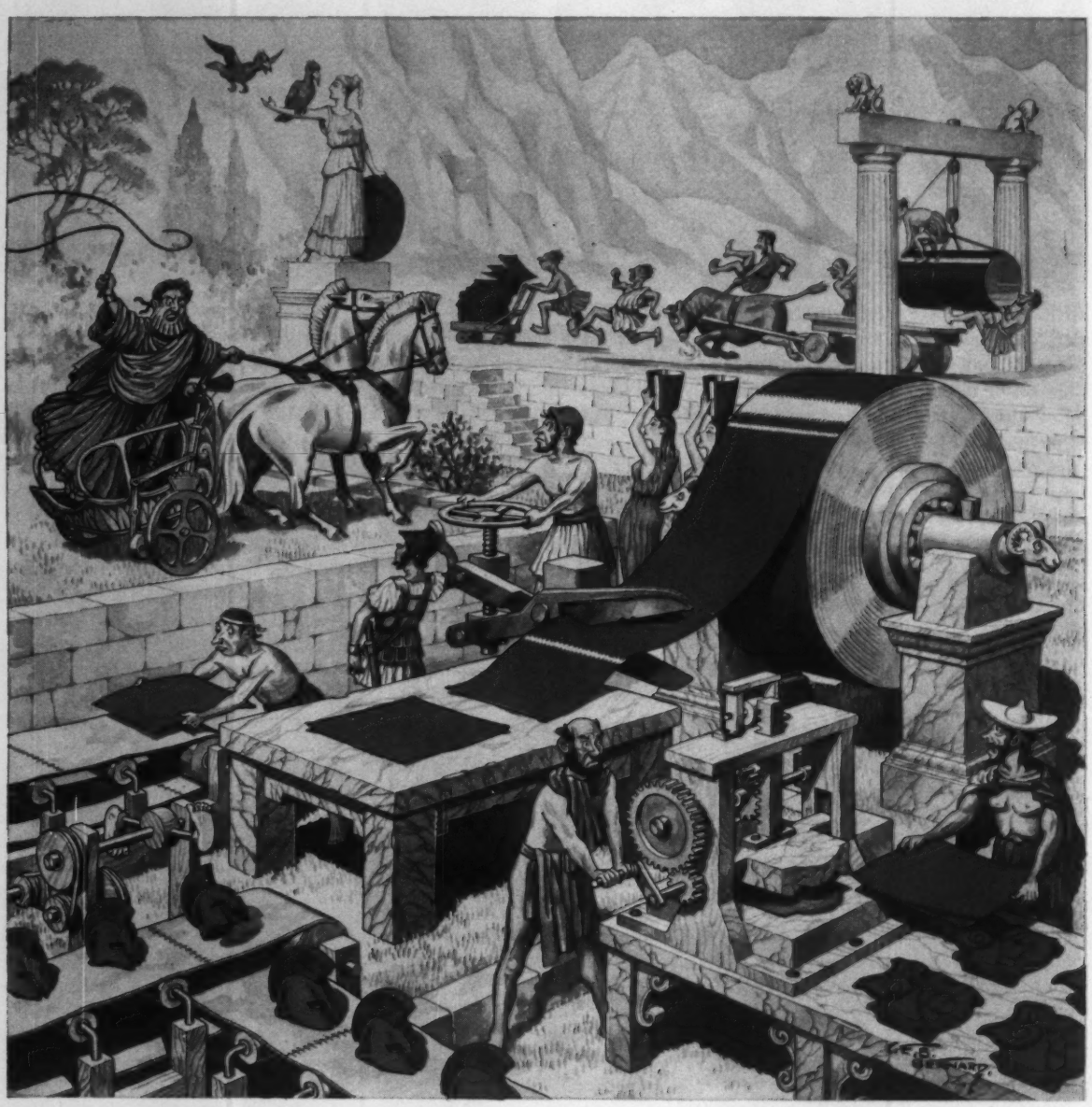
"So that you may be properly advised, this memorandum confirms a statement already made by Chrysler Corp. that there will be a 1961 line of De Sotos in the medium priced car class. This division is currently ordering production materials and scheduling De Sotos for introduction coincident with its other lines of cars.

"It is hoped this information will be of assistance in safeguarding you from giving credence and publication to further false rumors on De Soto."

Now it can be told

This engraved marble tablet recently uncovered in one of the long-lost Phrygian caves shows how Midas fooled the public. This stuff wasn't 14-karat at all. The "Midas Touch" is nothing but a myth. Midas used ColorRold* Stainless Steel, developed by Washington Steel Corporation. Gotta give the old charlatan a lot of credit though—he knew a good thing when he saw it.

MIDAS SPECS: 2 cubits × .025″ ± .001″ × coil, Type CCCII (302), Rb 82 max. Sunbrite gold, 50 glossimeter, 1 mil, paper interleaved, skidded for open oxcart only. 12 × 10^6 drachma max. wt. per coil.



*ColorRold, an organic coated stainless steel, comes in eleven harmonizing colors, can be formed and drawn or textured and highlighted in an infinite number of designs and effects, now available for your architectural or product needs.

WASHINGTON STEEL CORPORATION
and ColorRold®
PRODUCERS OF *MicroRold®* STAINLESS STEEL
WOODLAND AVENUE WASHINGTON, PA.

Kenneth B. Hollidge

He Looks for Better Packaging

K. B. Hollidge is guiding the Packaging Machinery Institute as its president.

Known in the industry as "Mr. Packaging," he has a long and impressive record in the field.

■ The Packaging Machinery Manufacturers Institute has at its helm as president for this year and next, Kenneth B. Hollidge, a man well known in the packaging machinery field as a "go-getter."

He has been a most active member of PMMI, having moved up "through the chairs." He served as a member of the Institute's first Show Committee, chairman of the second show, first vice president, and member of the Board of Directors.

His Accomplishments—From the day Mr. Hollidge joined Snyder Corp. in 1944, he has been tabbed as an aggressive merchandiser. He sells engineers on new equipment ideas, sells his sales force on the equipment, and, if necessary, he will go out and help them sell it to industry.

He began his career at Snyder as director of personnel, labor relations and advertising. He shortly became secretary of the corporation and later a member of its board of directors.

When Snyder Corp., a leading builder of special machine tools since 1925, decided to diversify its products and markets several years ago, Mr. Hollidge was in the forefront of those in the company producing for diversification.

In 1949 Snyder Corp. bought the Arthur Colton Co., a highly reputable 75-year old manufacturer of tablet presses and production equipment for the pharmaceutical industry.

K. B. HOLLIDGE: He is an aggressive merchandiser.

Mr. Hollidge was put in charge of this operation as its executive vice president, a position he has held since that time.

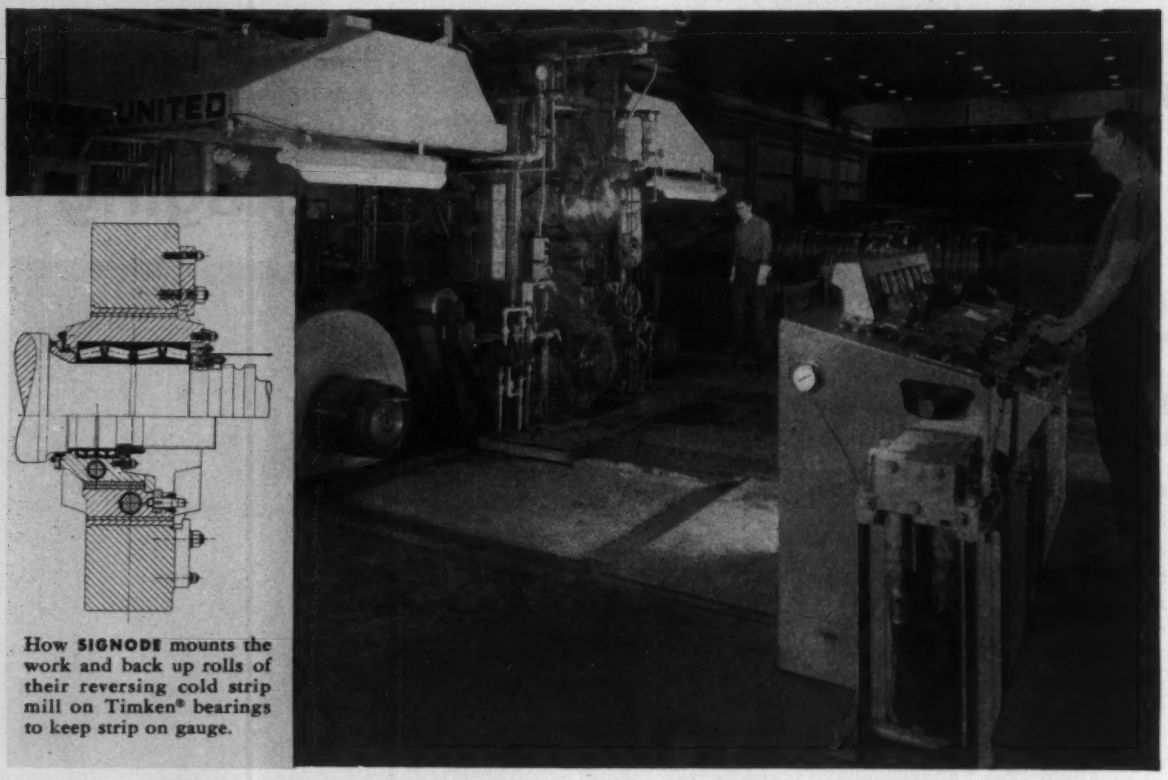
Under his direction, sales of Colton machines have doubled in less than 10 years.

Sales Philosophy — Behind this increase in sales lie two basic Hollidge philosophies: High speed machinery and aggressive sales effort.

Mr. Hollidge realized early in the game that unless the pharmaceutical industry was supplied with higher speed machinery, it would not continue buying the same old equipment in quantities forever. As a result he has emphasized the creation and development of high speed equipment and backed this effort with aggressive sales.

Expansion by Acquisition — Today it costs a fortune to develop new and different packaging machines from scratch. Mr. Hollidge is an industrial executive who always has one eye open to finding a market by acquiring a reputable company, retaining its trademark and merchandising and expanding its line.

He carried out these thoughts last year when Arthur Colton Co. acquired the Hope Machine Co. of Philadelphia, a leading 50-year-old maker of filling machines and vital items in packaging lines. The machines are being successfully merchandised under the name Colton-Hope.



How **SIGNODE** mounts the work and back up rolls of their reversing cold strip mill on Timken® bearings to keep strip on gauge.

Signode's new strip mill controls gauge to .0001" by X-ray Timken® bearings keep it on gauge

THIS new 4-high cold strip mill built by United Engineering & Foundry for Signode Steel Strapping Company has a special X-ray gauge that measures and records strip thickness to .0001". And mounting the work rolls, back up rolls, reel and screw down on Timken® tapered roller bearings helps keep this 11¼" and 29¼" by 20" reversing cold mill turning out strip on gauge—gives Signode maximum economy, assures customers strapping of uniform gauge.

Steel mills the world over use Timken roll neck bearings because they:

1) *Require minimum maintenance.* Timken bearings are tapered and provide the high radial and thrust capacity required by modern steel mill operations.

2) *Give long life.* To make them tough, only the finest bearing-quality alloy steel available is used for Timken bearing rollers and races. In some mills, Timken balanced proportion bearings have rolled over 5,000,000 tons of steel.

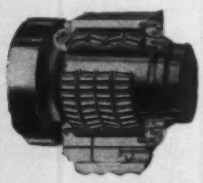
Timken bearings practically eliminate friction, cut starting resistance so that scrap losses are held to a minimum. They can be grease or oil mist lubricated to cut lubricant costs to the bone. It all adds up to the lowest bearing cost per ton of steel rolled. It's why Timken bearings are on the roll necks of 1,008 mills.

Be sure to get all these advantages when you buy or build a mill. Specify Timken tapered roller bearings and get the best in engineering service, the best in bearings. That's Better-ness. Timken bearings are the symbol of Better-ness in machines.

When you buy Timken bearings you get...

1) Quality you can take for granted.
2) Service you can't get anywhere else.
3) The best-known name in bearings.
4) Pace setter in lower bearing costs.

The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.



INDUSTRY rolls on

TIMKEN®

tapered roller bearings

Can Recession Be Held Off?

It's clear the recovery is running out of steam. But this doesn't mean an immediate recession is necessary.

Business can do much to keep the economy moving by its actions and attitude.

■ As a businessman, you can help keep the economy moving.

Admittedly, the recovery is tired. It's now about 26 months old (not counting the steel recessions in 1959 and 1960). This is close to the average length of recovery periods in the past.

But that doesn't mean a recession has to follow. How you (and other businessmen) act in the months ahead will be important. Both your plans and your attitude will be vital.

Consumer Doubts — Right now uncertainty is gnawing at business optimism. Consumers are getting more reluctant to buy. According to the University of Michigan's latest consumer attitude study, "doubts and uneasiness are more pronounced." It's possible consumers need new stimulation to stay optimistic.

Some moves to spur buying are here or on the way. The government's easier credit policy should encourage home building. In addition, it ought to stimulate public construction and other investment.

Sales Push—But what can business do to hold off a recession? For one thing, aggressive sales and marketing efforts are needed. But they must be tailored to the times.

Gas range manufacturers, for example, are finding out how to shift emphasis. The decline in home building cut into their sales. But by pushing replacement sales, they are keeping orders from dropping further.

Pricing is another critical area for business. Despite rising costs, efforts to hold the price line are important. The U of M survey shows many consumers believe price increases are bad—for themselves and the economy.

Avoid Cutbacks—Lastly, moves to cut back capital spending should be avoided, if at all possible. Retrenchment by one industry will only force cutbacks by another.

So far, industry is generally resisting this temptation. New construction is down only a little from 1959 levels. And most of the decline is in private housing, highway, and public school building.

Current business doubts may even have some positive value. As Dr. Emerson P. Schmidt, director of the U. S. Chamber of Commerce Economic Research Dept. puts it, "Uncertainty about which direction the economy will move may be beneficial. It may help energize activity, encourage better values, and improved goods and services . . . when there are no major maladjustments or roadblocks the intelligent efforts of executives generate greater prosperity."

How Population Shifts

■ First reports on this year's population census show some expected trends.

The Western states are chalking up impressive population gains. And the nationwide trek to the suburbs continues.

Preliminary reports list these population gains between 1950-1960 for states west of the Mississippi: California, 46 pct; Colorado, 31 pct; Nevada, 75 pct; Utah, 28 pct; New Mexico, 38 pct; Arizona, 71 pct; and Alaska, 74 pct.

Biggest single gainer, however, was Florida with an increase of 76 pct.

Metalworking Centers — But states with the largest metalworking populations (according to IRON AGE's basic marketing data on metalworking) held up well.

Many added more people than the average national gain of about 18 pct. California, as mentioned, added almost half again. Other large gainers: New Jersey and Connecticut, both about 25 pct; Michigan, 22 pct; New York, 11 pct; and Ohio, 21 pct.

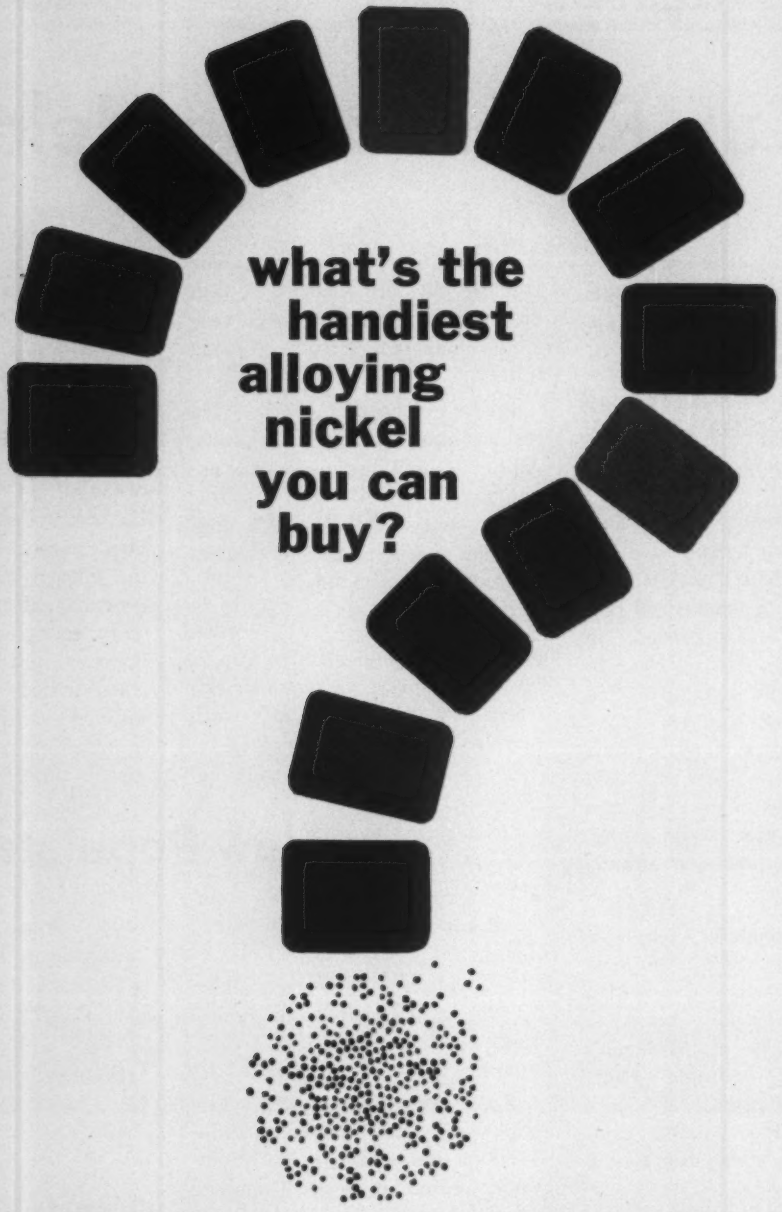
Smaller advances: Indiana, 17 pct; Illinois, 14 pct; Massachusetts, 9 pct; and Pennsylvania, 6 pct.

Imports Rose in May

Imports into the U. S. increased slightly in May over April levels, the Commerce Dept. reports.

May shipments of goods from overseas were $1.253 billion, a little above the $1.246 billion of April this year. They were also higher than the May, 1959, total of $1.247 billion.

Meanwhile, the value of U. S. exports declined about 2 pct in May from April.



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AT THE DRAWING BOARD: Industrial designer Gilson, right, inspects design progress at his California studio.

Can Corporate Image Survive Expansion, Diversification?

By C. W. Gilson—Channing Wallace Gilson, Industrial Design, Los Angeles

Corporate identity not only can survive diversification. It is a must in today's competitive business climate.

But it may take specialized abilities to do the job.

■ One of the greatest problems and needs of an expanding, growing company is to establish and maintain its corporate identity.

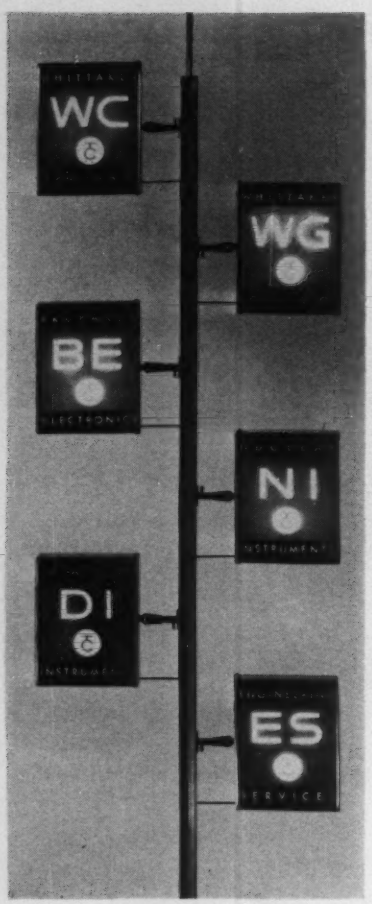
This is particularly true if the company's expansion is through adding new products that have little association with product lines.

And this problem is compounded if the company is also expanding through acquisition or merger. For these reasons, establishing corporate identity has become one of the most important jobs of the comparatively new function of modern business—industrial design.

Lack of Understanding — Although related to marketing and publications, identification is still a vaguery. Lack of understanding of the need for identification is still prevalent in business and industry, although its importance is now gaining some recognition.

In explaining the role of industrial design in today's competitive business, probably the best method is to describe the real problems of a real company, the approach to solving them, and the results.

One Company's Problem—Telecomputing Corp., Los Angeles, has been through this problem of establishing its identification. In the eyes of the industrial designer, the goal was to build the outward appearance of a personality identi-



IDENTIFICATION: Trademarks of company and divisions reflect continuity of visual identification.

fied as Telecomputing Corp.

The problems of Telecomputing are not unusual. But the methods of solving them show how all forces of communication can turn what could have been a serious problem into an advantage.

With its stepped up program of growth and expansion, TC saw the necessity of developing its new corporate identity. An industrial design firm was retained to plan and execute the work from top-level through divisions.

And Sub-Problems — Here are some of the sub-problems that had to be solved:

It was a first-name managed company. The president, William R. Whittaker, realized that this atmosphere would have to be altered as the company grew. But he was determined to maintain the feeling of employee identification.

Second, the company itself had an exceptionally long corporate name.

Third, it was saddled with a variety of namesake, hand-me-down, poorly thought-out brand names and trademarks.

In September, 1957, the three original TC divisions merged with two new subsidiaries producing nuclear testing and electronic equipment. This further diversified the company's products.

Clear, forceful identification was not possible with the variety of symbols. It was better to start out with a fresh approach than to take over old trademarks of acquired firms and force them "as is" into another pattern.

First Steps — All previous stationery, interoffice forms, labels, and packaging were redesigned. Members of the firm met with personnel on all levels of the company to educate them in the proposed concept.

As the corporation complex began growing through acquisitions and mergers, the industrial design program began to take shape to maintain divisional identification, but within the corporate image structure.

Each division was given its trademark incorporating its initials or call letters in the same shape as Telecomputing's brand, with the one addition of "TC."

Colors were used to further identify each division.

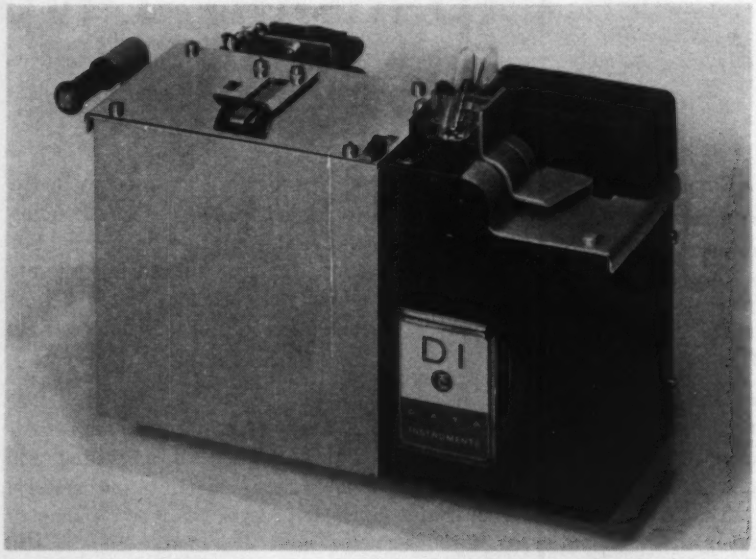
Support Needed — Most important, top management backed the program all the way and helped implement it down the line.

Then, the design firm was given creative scope and the opportunity of participating in the actual setting up and supervising work at all levels utilizing design concepts.

One division, for example, developed a new product in which we had contributed identifying colors, trademark identification, finish, and housing design.

Three Phases — Marketing and industrial design functioned together in creating the most favorable Telecomputing Corp. sales image. The approach was made in three major areas:

1. The industrial designers created the new visual image or identification: Two months of re-



DESIGN AT WORK: This tape perforator reflects product design as part of total functional design and identification of the company.

search; three months to reproduce basic visual formats; five months to complete the first key project; and fourteen months to integrate remaining projects.

2. Advertising developed the information on an institutional level, introducing the new concept of total identification. Products were advertised in conjunction with the corporate image.

3. Public relations released full information on growth of sales, mergers, engineering accomplishment and financial position.

Order Out of Chaos—At Telecomputing, stationery was singled out for the initial redesign phase. Because of acquisitions and mergers, there was a conglomeration of letterheads, envelopes, business cards, and interoffice forms labels.

Because the company is engaged in technical fields, it was logical the format should reflect a modern conservatism.

The long company name was too much of a mouthful. Therefore, the initials "TC" were utilized to overcome this objection.

Divisions Integrated — To help explain the company to its customers, every letterhead, business card, envelope and form included the names of all divisions below the corporate name.

Divisional names were also brought into the program. Frank B. Cook Co. of Denver became Cook Batteries, call letters "CB," for example.

To be successful, an industrial design program must mature and develop over a period of time. Doing everything at once disrupts normal activities. And, as in the case of stationery, a smooth transition was accomplished without costly destruction of inventories.

Total System—Then, after the house was put in order, the industrial design firm found the way clear to conceive a more compelling trademark system. This would also have to go through a maturing period before reaching acceptance.

PACKAGING AT WORK: Reusable boxes and cartons bring Whittaker Controls Div. story to the flight line as valves and controls are replaced.

To explain the company in advertising and other identification pieces, each division was given a unique square trademark.

Design Research—Design of the Corporate trademark evolved from the TC nickname. The exact form was derived after extensive research.

Results of these studies brought about a new concept of the classic symbol of the sun and the world or universe, as a Space Age symbol. This was combined with the western brand look.

When it is feasible, trademarks and symbols should be designed for divisions with similarity among the group.

One illustration of added benefits is in packaging. In Whittaker Controls, for example, the "image" is exploited visually and physically in packages of aircraft valves.

The mechanic takes the boxed package of new valves to the flight line and replaces the new unit with the old unit in the same package keeping identification before the customer in every way.

But the final success of the total industrial design program does not rest in the hands of the industrial designer. Only with the understanding of management and its cooperation can the program succeed. If management's decisions vacillate, the end result will be a distorted image.

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ERMETO Ease of Assembly Saved These Companies TIME and MONEY

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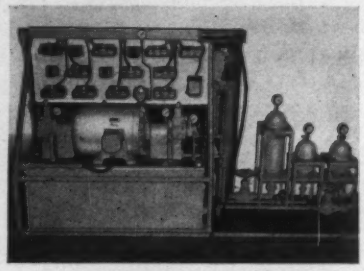
SAVED: $5,000

COMPANY: Good Roads Machinery Corporation Minerva, Ohio.

APPLICATION: Carbon Steel Ermeto fittings on hydraulically-actuated snow plows on industrial tractors. Operated with hydraulic oil at 100° F and 400 psi.

RESULTS: Ermeto fittings saved the company $5,000 because of their ease of assembly and because experienced help was not necessary.



SAVED: 60 HOURS

COMPANY: Portland Industries South Portland, Maine

APPLICATION: Carbon Steel Ermeto fittings on automatic transfer machine for making carburetor bodies. Operated with hydraulic oil at 120° F and 800 psi.

RESULTS: Utilization of Ermeto fittings saved the company 60 hours in installation time — thanks to the ease and simplicity of assembly.

SAVED: 40 HOURS or $240

COMPANY: Emhart Manufacturing Company Hartford, Conn.

APPLICATION: Carbon Steel Ermeto fittings on pressure forming machine for small parts manufacture. Operated with hydraulic oil at 130° F and 1500 psi.

RESULTS: Ermeto fittings provided an estimated savings of 40 hours or $240 in installation time. Ermeto fittings were used specifically because of their ease of assembly.

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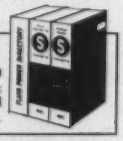

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Autos Hit Second-Best First-Half

Fourth Quarter Holds Key to Make It Near-Record Year

In the first half of 1960, output reached 3.8 million cars. This trails only 1955.

A good fourth quarter will give the industry its second-best year.—By A. E. Fleming.

■ Moving into the last half of the year, it looks like U. S. car production is headed for a 1960 total of 6.8 million.

The first six months were kind to car makers, despite some early scares. They produced 3.8 million cars, second best count ever reached.

The record was reached in 1955 when 4,257,000 cars were made from January through June. Since then first-half output has been: 1956, 3,192,000; 1957, 3,370,000 1958, 2,242,000; 1959, 3,284,000.

First half production by months was: 688,000 in January, 659,000 in February, 654,000 in March, 582,000 in April, 611,000 in May and 613,000 in June.

Second Best Year? — Changeovers to 1961 models will hold the third quarter total below 1.2 million. By the end of September the industry will have made about 5 million cars.

The fourth quarter will tell the story. But it's still an unknown quantity. October is shaping up big. If car buyers cooperate, the year could wind up at the 7 million level. Perhaps more realistic, however, is an October-December total of 1.8 million, and a 6.8 million total for 12 months.

Anything over 6,674,000 units would make 1960 the second best year in history. That figure was reached in 1950 and stands only behind 1955's 7,942,000. Last year 5,593,000 units were produced.

Winners and Losers—Aside from Big Three compacts, which weren't around last year, nine makes of cars are ahead of 1959's production pace at the half way point. Seven are trailing.

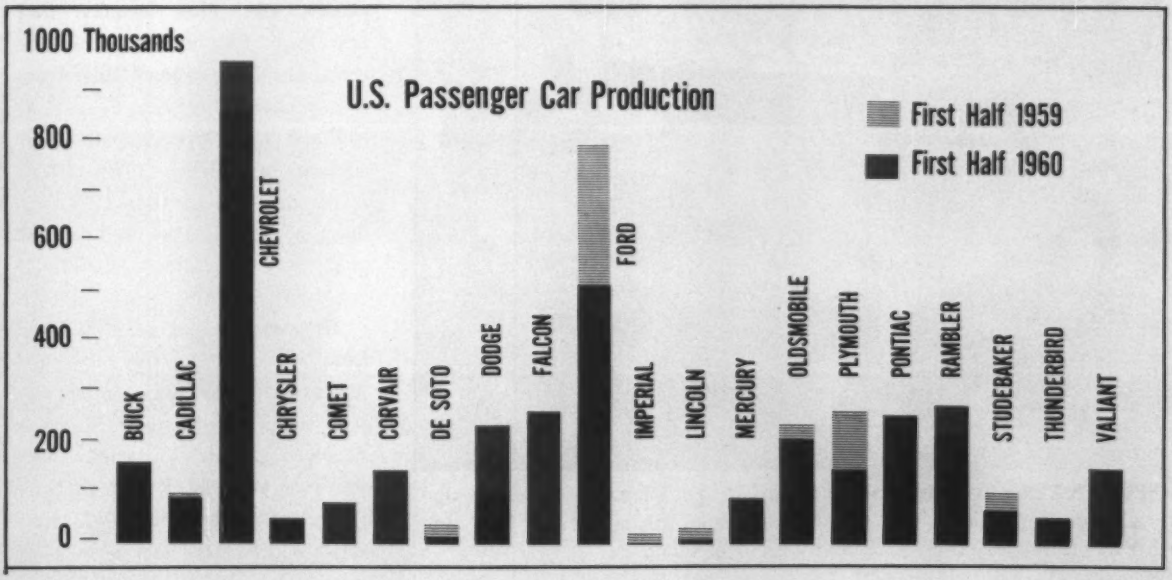
The gainers and the volume they are ahead of last year are: Dodge, 141,000; Chevrolet, 82,000; Rambler, 60,000; Buick, 21,000; Thunderbird, 12,000; Mercury, 9000; Pontiac, 9000; Chrysler, 4000; and Cadillac, 1000.

Behind last year's pace are: Ford, 266,000; Plymouth, 109,000; Studebaker, 24,000; De Soto, 15,000; Oldsmobile, 14,000; Lincoln, 5000; and Imperial, 3000.

Compacts Are Popular — The compacts that weren't on the market last year — Corvair, Falcon, Valiant and Comet—accounted for 645,000 units in the first half. Without them output would be dragging 120,000 units behind last year.

Production heads downward in

Some Makes Have Gained, Others Lost



the next month. This leaves sales as the only economic gage of the auto market. After a rather disappointing start in the first quarter, sales improved. There are predictions that 1960 sales will total 6.7 to 6.8 million units. This would include 500,000 imports and 6.2 to 6.3 million U. S. cars.

Taking Over — The low-price field — U. S. compacts, low-price foreign models, Chevrolet, Ford, Plymouth and Dart—is taking 75-pct of the market. The average during the 1950's for this field was a little over 50 pct.

With new Buick, Oldsmobile, Pontiac and Dodge compacts due this fall, some predict the share will rise to 80 pct before the end of 1960.

The Swivel Seat Swivels Out

Although the company isn't talking about it, the swivel seat will probably be dropped from Chrysler Corp.'s optional equipment list next fall.

Supposedly designed to make it easier to get into and out of today's low roofed cars, the special seat simply hasn't been popular with the buying public.

Short History—The swivel showed up exclusively on all lines from Plymouth to Imperial in 1959 models. A year later automatic action appeared. But not even the magic of a seat whirling out to meet a passenger at the opening of a door, or swinging back into place when the door is closed, has stimulated much interest.

Pointing up the lack of interest are the following rates of factory installation of swivel seats in 1960 model production through May: Plymouth 2.1 pct, Dart 0.6 pct, Dodge 3.9 pct, De Soto 11.5 pct, Chrysler 7.0 pct, Imperial 17.5 pct. The Valiant doesn't offer the special seat.

High Cost—One of the swivel's drawbacks is price. Factory retail cost of the manual seat is $66.90, the automatic $87.15. The costs are higher than power brakes and, in some cases depending on the car, are above power steering, push-button radios and heaters.

Other auto companies have tested their own versions of the swivel seat the past few years, but none has come out with them. Chrysler's experience may even further discourage such plans.

Few Accessory Changes Ahead

To keep old cars running, Americans spend $10 billion a year for parts, accessories and service. Are any major changes ahead that might affect this giant auto service market?

Among those most qualified to answer are top engineering and marketing executives of the Weaver Manufacturing Co., Springfield, Ill. A division of the Detroit-based Dura Corp., Weaver is the oldest and largest exclusive manufacturer of auto service equipment.

Fewer Fittings—Weaver officials say the most significant change in passenger cars to affect the service trade has been a reduction in the number of lubrication fittings. They expect the trend to continue, with likelihood that fittings will be gone by 1965. This means service stations will lose all or most of the chassis lubrication business they now have. But lubrication will be replaced by increases in other types of mechanical service.

Fleets are a growing part of the automobile market (The IRON AGE, April 14, 1960, p. 133). Will fleet service operations take the place of the corner gas station for car repair work?

They don't think so at Weaver. Leased cars are usually new, and new cars need less service, they say. And since leased cars are likely to become privately owned after they're a year old, it isn't expected the trend toward fleets will have much effect on the service industry.

At the Beach This Bug's Not a Pest

SPORTS BUG: Crofton Marine Engine Co., San Diego, is building a small, multi-purpose vehicle called the Crofton "Bug." It's aimed at a wide number of off-highway uses, particularly for sportsmen.

MORE THAN 5,000,000 TONS OF STEEL WITHOUT A BEARING FAILURE

The Torrington Company, Bantam Bearings Division, South Bend, Indiana, is especially noted for the high quality of its rolling mill bearings. Usage of modified AISI 3310 USS CARILLOY Steel in races enables Torrington to manufacture quality bearings with a foot-pound energy absorption rate of a magnitude impossible to obtain with any other conventional alloy steel. Translated into performance, rolling mills equipped with these bearings have produced more than 5,000,000 tons of steel without a bearing failure!

Before using the modified USS Alloy grade, Torrington tried several different types of steel which gave considerably lower tonnages before failure occurred. Then with the application of the 4% nickel alloy (Modified 3310) they first succeeded in obtaining progressively higher tonnages to the 5,000,000-plus tons of rolled steel production enjoyed today.

In addition, the Torrington Company uses the 52100 series of USS CARILLOY Steels. The types of 52100 steels used in through-hardening anti-friction bearings consist of grades similar to AISI 50100, 51100, and 52100. These steels have certain special characteristics such as wear resistance and compressive properties essential in bearings, which are obtained by adding varying amounts of chromium to high carbon steels.

The chromium, manganese, silicon are varied according to the cross section involved in the finished part and its expected response to heat treatment, or the microstructure needed to impart wear and other special properties. USS CARILLOY Steels in this class have long been noted for their superior quality, cleanliness and wear resistance.

Special alloy steels such as those used by Torrington can be developed for other special needs. In addition, all standard alloy steel grades in a complete range of USS bar and semi-finished sizes are available. For more information, write United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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United States Steel Supply—Steel Service Centers
United States Steel Export Company
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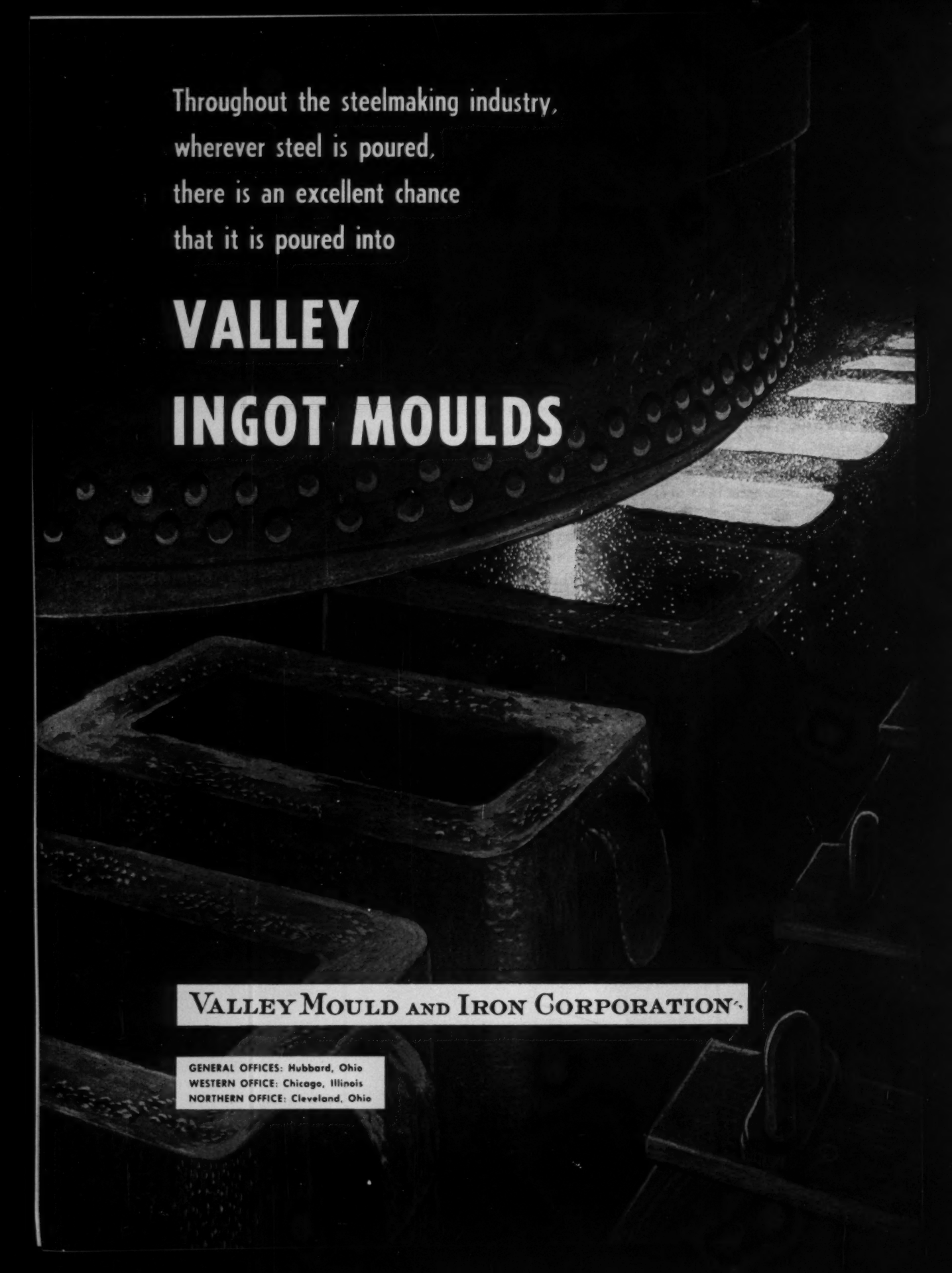
Inspector checking a Torrington 4-row tapered roller bearing used in metal rolling mills. A special 4% nickel alloy was used for greater wearing qualities.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New Laws Don't Impress Industry

Only a Few Major Bills Made It Through Congress

A bogged-down Congress took little action on bills affecting business. It's bill-a-month average didn't accomplish much.

Industrial bills are stalled off in the wrong direction. Political factors will affect late legislation.—By R. W. Crosby.

■ Congressional action so far this election year may please civil rights supporters, Federal employes, and foreign aid advocates, but it doesn't impress industry.

Of the more than 5500 bills introduced in the Senate and House since January, only a half-dozen or so major measures won Congressional approval.

Those in which industry is most interested either have gone in the wrong direction or are stalled until Congress returns in August.

Major Legislation—Besides the Civil Rights Act of 1960 (on which Congress spent half the session), the 7.5 pct pay rise for 1.5 million Federal employes, and authorization of foreign aid appropriation, Congress also:

Adopted a constitutional amendment granting the right to vote to residents of Washington, D. C.

Ratified the Japanese security treaty.

Passed major appropriation bills.

This major legislation is undoubtedly important. But from a selfish point of view its importance to businessmen is negligible.

The single bright spot for industry among approved legislation was the $40 billion defense budget calling for military modernization.

The Other Side—On the other hand, the legislators extended the corporate income taxes, shelved other long-promised business tax reform program until next year, and left hanging legislation which would be a shot in the arm for construction.

Two construction bills, housing and schools, must wait for the late summer session called by Democrats who expect to make political hay during the recess.

The housing bill is a $1.2 billion omnibus measure calling for college dormitory construction, urban renewal and public housing programs, extended mortgage assistance and home-improvement loan programs. The school bill sets up a broad program of federal-state construction subsidy.

In the Air—Also awaiting action in the post-convention session are bills to raise the present $1 an hour minimum wage and set up a federally-subsidized medical care for the aged program.

Likewise suspended is action on a bill authorizing tax deductions for self-employed persons who set up private retirement funds.

These bills awaiting Congress' return will undoubtedly become political footballs. The Democrats will try to pass them on to President Eisenhower in their most expensive shape. Thus the President will be faced with the politically-explosive decision of the veto.

Congress may add at least $1 billion in Federal spending to President Eisenhower's budget for this fiscal year.

This would push Federal expenditures to a record peace-time high.

Metalworking Bucks Tariff Cuts

■ Government plans to cut tariffs are drawing a loud "no" from industry. Metalworking firms are shouting the loudest.

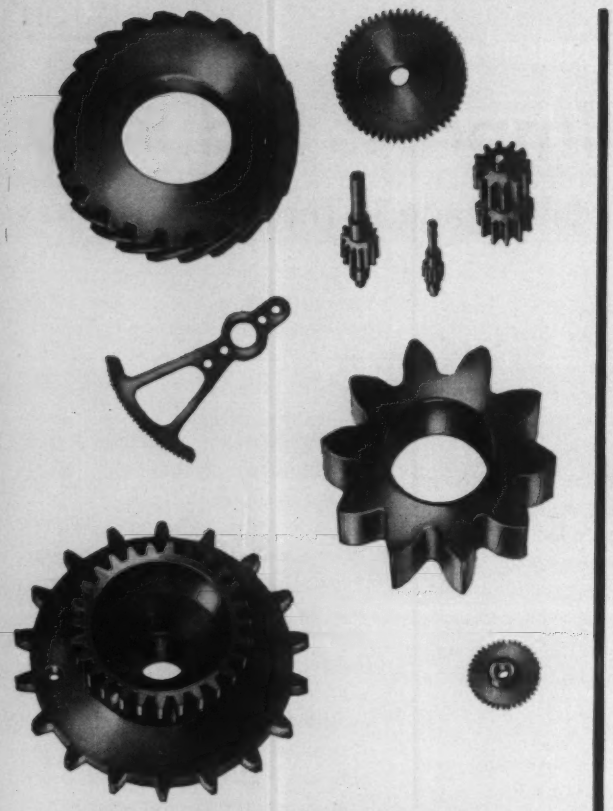
More than 100 metalworking firms and associations have asked to appear at hearings now going on in Washington. The metal schedule, largest list of possible tariff concessions, will be the last to be heard. Metalworking spokesmen will begin appearing at the end of August.

The list of metals and metals products on which the U. S. is considering tariff cuts runs more than 20 pages. Tariff commission officials expect the metal hearing to take two weeks.

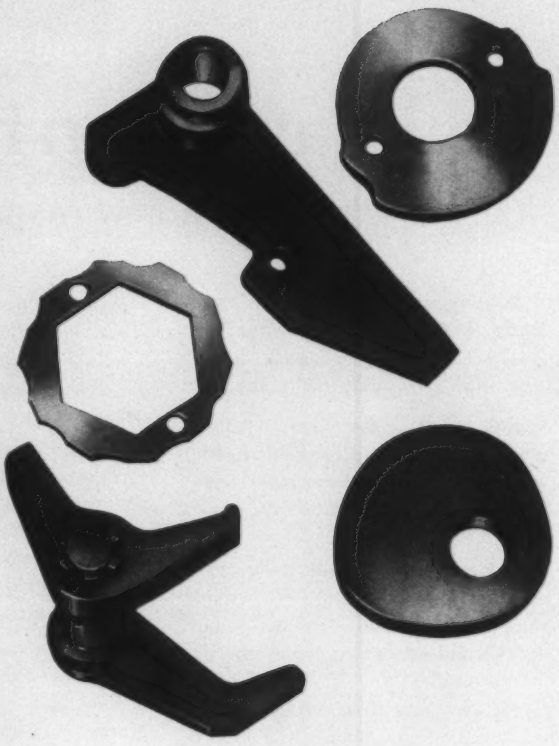
Report to President—Metalworking spokesmen will tell the commission that existing rates of import duties are already low enough. They will insist the State Dept.'s plans to cut rates should be cancelled.

After the hearings end, the commission will review the testimony and then write a private report to President Eisenhower.

It will name the so-called peril-points, below which U. S. tariffs should not be reduced. State Dept. officials will take this list to Geneva, Switzerland, with them in September. For the next 12 months they'll negotiate with representatives of other nations concerning lowering of tariffs.

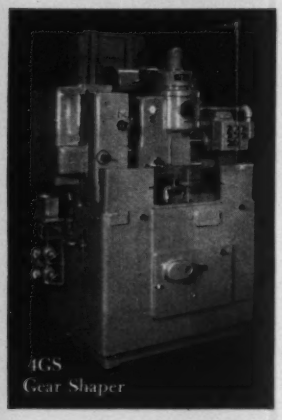


INVOLUTE GEARS



NON-INVOLUTE PARTS

FELLOWS GEAR SHAPERS DO DOUBLE DUTY



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Fellows Gear Shapers are not limited to the production of gears alone. They are valuable production machines ideal for the manufacture of many types of parts, of both involute and non-involute form.

As gear shapers, they provide high production rates in the manufacture of internal and external spur and helical gears. As general purpose production machines, they also make possible the economical production of irregularly shaped parts . . . in many cases doing in one simple operation what would require several operations using conventional shop tools.

Your Fellows representative will gladly give you the facts on how the complete Fellows line of production and inspection equipment helps increase production and cut costs. Ask him, or write direct.

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What's in Store for Farwest?

Look for Slight Slowdown in Early 1961

Right now consumer and government spending, orders for capital equipment are keeping Farwest economy strong.

But a slowdown in some spending is expected early in '61, followed by recovery after mid-year.—By R. R. Kay.

■ What's the West Coast's business outlook for the rest of this year? And what's in store for 1961?

Business activity will expand at a faster rate for the rest of 1960—probably to peak levels. Why?

Three Reasons—A gradual rise in business spending for new plant and equipment is in prospect. It will come mostly from outlays for new equipment.

Consumer buying of durable and nondurable goods should continue to rise.

State and local government spending will grow steadily.

On the negative side, there are weaknesses in overall construction, mostly in housing. And the defense dollar is being spent at a slower rate.

Next Year's Outlook—Now what about 1961?

There'll be a slowdown in capital and consumer spending—and some inventory liquidation, too. The 1961 downturn isn't expected to be severe. And the West Coast's economy probably will recover shortly after mid-1961.

New housing starts will lead off. Defense spending will be in the front ranks.

Confidential Report—These forecasts were released exclusively to The IRON AGE. They're from a company confidential report made by one of the largest Coast Corporations. It's a large company with extensive customer relations.

Mill for Washington?

There's a good chance that Washington State will get a new steel mill "in the near future."

Several companies are studying the feasibility of a steel mill. So says Mr. Sam Boddy, Jr., State Commerce and Economic Development Director.

Mr. Boddy says two firms will soon announce their construction plans. Right now, he's not giving out any names.

Washington's research on coking coal, iron ore, and markets focused the steel industry's attention there.

Power for Aluminum

A Los Angeles manufacturer of aluminum sheet and coil stock apparently has a Bonneville Power Administration commitment for power to start a primary aluminum facility. Site: Longview, Wash.

United Pacific Aluminum Co. is behind the project. Size of the plant is still in the discussion stage. But it will probably have a 20,000-ton-per-year capacity.

Complete details on the project will probably be announced in a few days.

What to Expect in Farwest

	Production or Spending		Employment	
	1960	1961	1960	1961
DEFENSE	(same)	(same)	down	down
Aircraft	down	down	down	down
Missiles	UP	UP	UP	UP
Electronics	UP	UP	UP	UP
CONSTRUCTION	down	UP	down	UP
Residental	down	down	down	down
Nonresidential	down	UP	down	UP
Public	UP	UP	UP	UP
CONSUMER GOODS	UP	down	UP	down
Durables	UP	down	UP	down
Nondurables	UP	UP	UP	UP

Part of a shipment of XM10E1 rocket motor metal parts assemblies manufactured by Parish for the Army's Lacrosse missile, a vital weapon in America's arsenal.

PARISH Helps Mass-Produce Missiles to Protect America!

Building *motor metal parts assemblies* for the U.S. Army's Lacrosse missile—being produced by Martin Company—calls for the capacity to produce in quantities a high precision mechanism of the most rigid specifications—so the job went to Parish.

To insure reliability and accuracy . . . to enable the missile—while traveling at fantastic speeds—to hit a target, the motor metal parts assembly cannot vary more than ¼ of 1% of design weight. It must be perfectly balanced and all parts must be completely interchangeable.

Parish has the diversified facilities, the tools and experienced personnel to produce these ultra precision assemblies in substantial volume. If you have a production problem that fits this pattern, write to us. We can help.

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Atoms Aid Machining Research

Radioisotopes Help in Tool Wear Tests

Nuclear methods are often valuable in machining studies on space age metals.

Researchers at Cincinnati Milling Machine Co. describe how radioisotopes are used. — By R. H. Eshelman.

■ American industry is studying new materials to support explorations of space, science and technology. The old metals just won't do for nuclear reactors, missiles, satellites and rockets. And it's necessary to step up not only the search for new and better materials —but also learn how to deal with them.

Knowledge Wanted — Many of today's toughest manufacturing problems are posed by high-strength, thermal resistant alloys. Is the answer solely to rely on cutting speeds and feeds of the 1930s? And what about rising machining costs? Today American industry pays about $10 billion a year to cut metal.

Coping with these problems clearly called for more knowledge, according to researcher at the Cincinnati Milling Machine Company. At a recent Society of Automotive Engineers meeting two of its scientists, Marko Paliobagis and E. J. Krabacher, noted what has been going on in machining studies.

Radioisotopes Used—Their carefully documented paper points out how radioisotopes can broaden the approach to machining studies.

Under Dr. M. E. Merchant the Cincinnati laboratory has pioneered in using radioisotopes. This group has found in the past 10 years that they are a very powerful tool, particularly for investigating problems of tool wear.

Wear Tests Made—During this time they made more than 600 tool wear evaluations, and more than 6000 tool wear tests. They studied cutting speed, feed rate, work materials, tool materials, fluids, geometry, methods of tool preparation, effects of vibration, and rigidity.

One study concerned the relative machinability of high silicon content aluminum alloy — reportedly under study for auto engine design. They also compared carbides with high speed steel for tools, and made special studies of how a milling cutter cuts.

Spokesmen for the lab point out the specific savings of the nuclear techniques. By conventional approach the aluminum alloy machining tests would have taken at least six weeks. In addition they would have chewed up vast amounts of metal—which are often scarce during experimental periods. Their radioactive method took five days and exactly 20 pounds of metal.

Plate Method Used—An intriguing feature of their work is a photographic technique they have perfected for assessing results. This is the autoradiograph. The photographic record is made by placing a chip cut by a radioactive tool in contact with special film. Radiation exposes the film.

ATOMS AT WORK: Cutting tools irradiated by the thermal neutron process are used to study tool wear in this setup at Cincinnati Milling Machine Co.'s research and testing laboratory.

INDUSTRIAL BRIEFS

Transformer for Massena — A prototype foil - wound aluminum power transformer has recently been shipped by General Electric's Power Transformer Dept., Pittsfield, Mass. to Aluminum Co. of America. The developmental transformer is a step-down unit to be used in supplying power at Alcoa's Massena, N. Y. fabricating works.

For Splicing Breaks — Reynolds Metals Co. will equip all its aluminum foil manufacturing facilities with ultrasonic seam welding equipment. A second foil seam welder has been ordered from International Ultrasonics, Inc., Rahway, N. J. The equipment is installed on foil processing machinery to splice breaks. At present, tape is used for splicing.

Youngstown Sheet Expands— Pittsburgh Engineering & Machine Div., Textron, Inc., is building slab shearing, conveying and piling equipment for a blooming mill at the Brier Hill Works of the Youngstown Sheet & Tube Co. It is also building slab handling facilities for the No. 2 blooming mill at the Campbell Works. These orders are part of a multi-million dollar expansion program.

USS Film at Festival — "Rhapsody of Steel," U. S. Steel's documentary motion picture tracing the development of steel through the ages, was shown at the Tenth International Film Festival in West Berlin, July 4. The invitation to hold the film's premier European showing was extended to U. S. Steel by the West German Government.

Electroplating Analysis — New and enlarged laboratory facilities for electroplating analytical and technical services have been established by Metal & Thermit Corp. The Field Service Laboratory headquarters a technical staff qualified in application of M&T Unichrome plating chemicals.

New Plant for Ferro—The Refractories Div. of Ferro Corp. will build a new $300,000 plant in the Los Angeles area. It will manufacture a line of refractory specialty items now produced by the division's Louthan and CESCO plants in E. Liverpool and Crooksville, O. It is expected to go into operation later this year.

Mahon's Western Operation— The R. C. Mahon Co., Detroit, went into production at the new plant of its Western Operation at 2600 Monterey St., Torrance, Calif. It will turn out Mahon building products, industrial equipment, and also handle structural steel fabrication and erection work. Cost of the new administrative and manufacturing center was $3.5 million.

Marshall Steel Acquired—Henry G. Thompson & Son Co., New Haven, Conn., has contracted to purchase the assets of Marshall Steel Co., McCook, Ill. The operations presently carried on by Marshall will be continued by a new company, which will be a wholly-owned subsidiary of The Thompson Company. The subsidiary will take on the name of The Marshall Steel Co.

Bauer Equipment Formed— Bauer Equipment & Supply Co. has been formed at 139 N. Clark St., Chicago. It will handle sales of abrasion resistant castings of manganese steel, alloys steels, and Ni-Hard iron. Malleable iron, friction iron, and carbon steel castings, and a line of bucket elevators, drag conveyors, and belt conveyors will also be offered.

Hagnas Heads ACI — J. D. Hagnas is the new president, Alloy Casting Institute. He is sales manager, The Ohio Steel Foundry Co., Springfield, O., and succeeds J. B. Dear of the Duraloy Co., Scottdale, Pa. Two new members were named to the board. They are: J. K. Louden, Lebanon Steel Foundry, Lebanon, Pa., and J. W. McKay, American Cast Iron Pipe Co., Birmingham, Ala.

Merger Planned — The McKay Machine Co., Youngstown, O., and The Federal Machine & Welder Co., Warren, O., plan to merge. McKay plans to offer Federal stockholders one share of its common stock for 19 shares of Federal. The companies have a combined work force of more than 1100 employees including an engineering staff of about 150, and about 300,000 sq ft of manufacturing area.

More Natural Gas—Texas Eastern Transmission Corp. is planning a 50-million-cubic-foot expansion in daily capacity of its natural gas pipeline system. It includes about 66 miles of 30-inch-diameter pipeline loops to be added to the company's system between Vidor, Texas, and Lambertville, N. J. Cost of the program will be about $17.5 million.

Sea Water Conversion—Cleaver-Brooks Special Products, subsidiary of Cleaver-Brooks Co., has a contract in excess of $200,000 to build the largest sea water conversion plant in the U. S. and its possessions. The plant, to have a capacity in excess of 275,000 gallons a day, will be installed at St. Thomas, Virgin Islands. Contract was let by the Virgin Island Corp., subsidiary of the Dept. of Interior.

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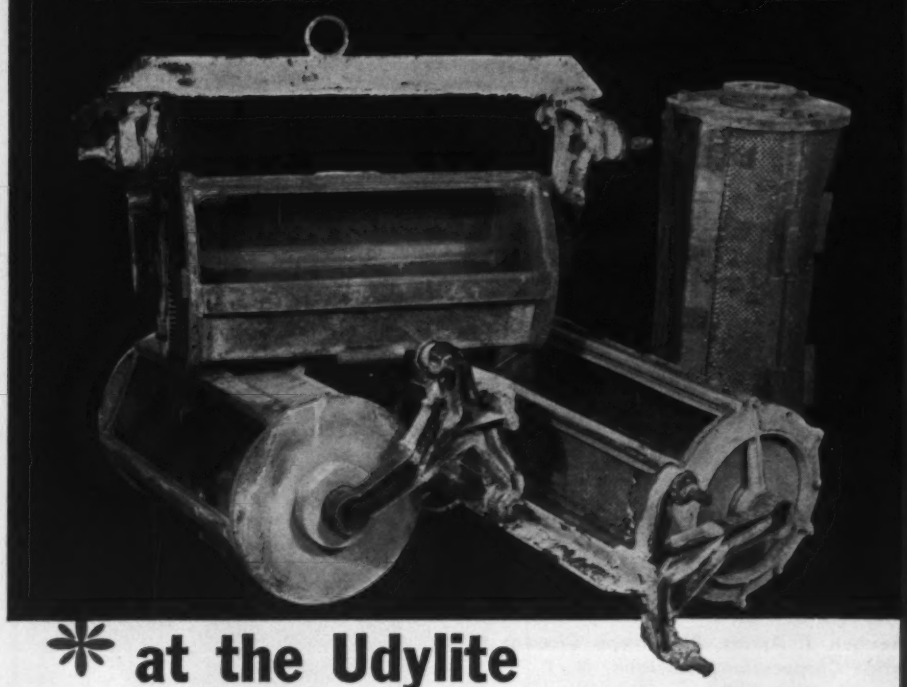

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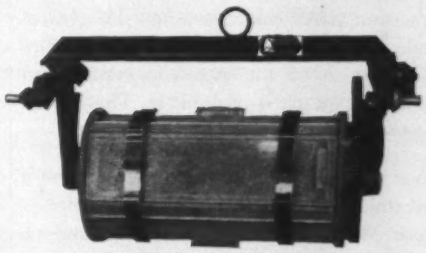

Hundreds of barrel units have already passed through our Project Alert lines. Every job from the simplest repair to complete renovation has meant equipment salvaged—its useful life extended and real cash savings for plating operators everywhere.

Through Project Alert, barrels in *any* condition are renovated and returned to the line. The program is flexible . . . it provides the exact restoration necessary to put each crippled unit back into productive use. It works! . . . it has proven a valuable economy for hundreds of satisfied Udylite customers.

Get "extra mileage" from your tired, worn out barrel equipment. Ask your Udylite man now or contact Lee Morningstar at Udylite today.

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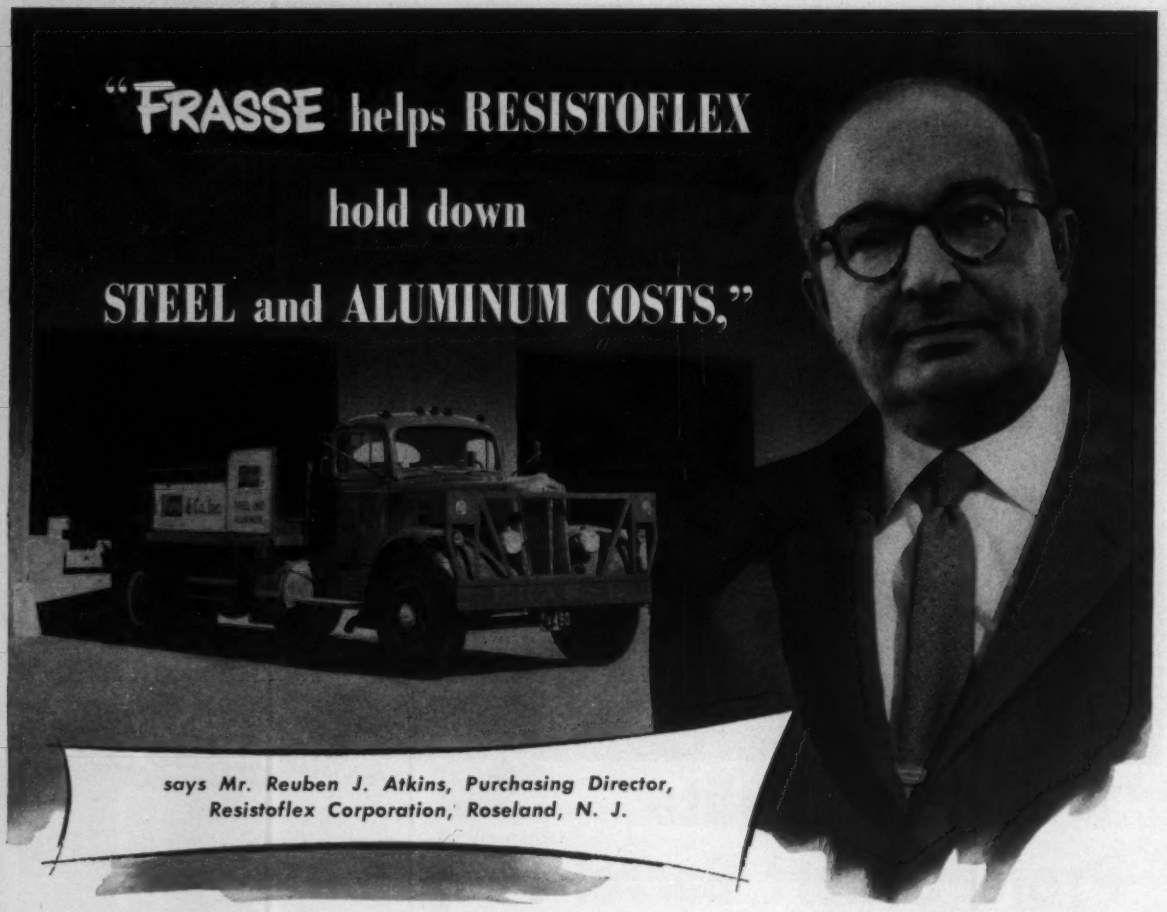
"FRASSE helps RESISTOFLEX hold down STEEL and ALUMINUM COSTS,"



says Mr. Reuben J. Atkins, Purchasing Director, Resistoflex Corporation, Roseland, N. J.

"We produce a variety of precision parts and assemblies for critical applications in aircraft and missile work," says Mr. Atkins. "Reliability is a must—deliveries are always urgent . . . yet the cost of maintaining an inventory of the grades, shapes and sizes we use is prohibitive. That's why, years ago, we turned to Frasse as our source for steel and aluminum.

"Frasse, in effect, maintains our inventory . . . delivers our needs on a job-by-job basis. Our capital investment is held to a minimum . . . plant space is put to more profitable use. We save the cost of labor, handling, processing and obsolescence. Further, we incur no expense until material is needed . . . then only the *initial* cost—not the added *high cost of possession.*"

Why not weigh the advantages of this modern solution to your inventory problems? You get broad selection, fast deliveries—and expert technical advice. Make Frasse your *first* source for steel and aluminum. You'll find this quick, convenient . . . and far more economical than supporting your own inventory.

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J. E. Workman, elected president, Latrobe Steel Co.

Sun Oil Co.—**W. A. Romeiser,** named general manager, Industrial Products Dept., Philadelphia general office.

Van Straaten Chemical Co.—**J. E. Kessler,** named technical sales director.

I-T-E Circuit Breaker Co.—**W. D. Jameson,** named manager, Buffalo district sales office.

Electric Steel Foundry Co.—**C. H. Pedersen,** appointed sales manager, Seattle District.

Jones Machinery Div., Hewitt-Robins Inc.—**M. C. Stafford,** appointed manager, product sales.

Foote Mineral Co.—**W. A. C. Eldon,** named operations manager, Cold River, N. H., plant.

Refractories Div., H. K. Porter Co., Inc. — **E. A. Axelson,** appointed Pittsburgh district sales manager.

AMCO Div., American Metal Climax, Inc.—**Frank Blum,** appointed manager, Boston office.

Reynolds Metals Co.—**L. G. Schnauz,** promoted to Eastern regional packaging sales manager.

The Barden Corp.—**W. R. Ferguson,** appointed director, purchases and **K. A. Taylor,** to purchasing agent.

Union Carbide Corp. — **H. K. Intemann,** named director, purchases; **W. H. Feathers,** appointed president, Union Carbide Metals Co., and **J. R. Johnstone,** named president, National Carbon Co.

Jomac-North, Inc.—**W. I. Hollar,** elected vice president.

The Eimco Corp.—**T. F. Olson,** appointed financial vice president; **W. L. Dowdey,** elected a vice president; **Dr. Don Dahlstrom,** named vice president.

Borg-Warner International Corp. —**John Carr** and **Col. E. W. Haefner,** elected vice presidents.

R. S. Baker, appointed vice president, manufacturing, The American Brass Co.

Hooker Chemical Corp.—**A. R. Perry,** appointed controller.

Titeflex, Inc.—**F. W. Hornbruch, Jr.,** elected president and chief executive officer.

Climax Molybdenum Co. — **M. R. Ahrens,** appointed asst. manager, abrasion resistant alloy development.

Dominion Brake Shoe Co.—**H. M. Brownrigg,** elected vice presi-

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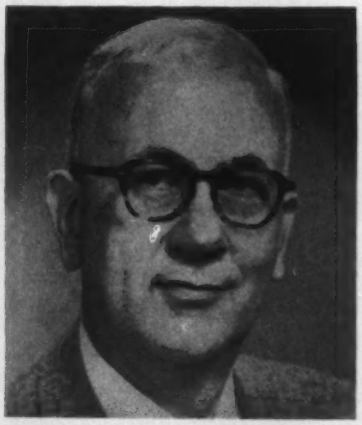

M. J. Gross, elected manufacturing vice president, Consolidated Vacuum Corp.

Max Garber, elected marketing vice president, Consolidated Vacuum Corp.

Dr. W. A. Bain, elected vice president, Air Products, Inc., Allentown, Pa.

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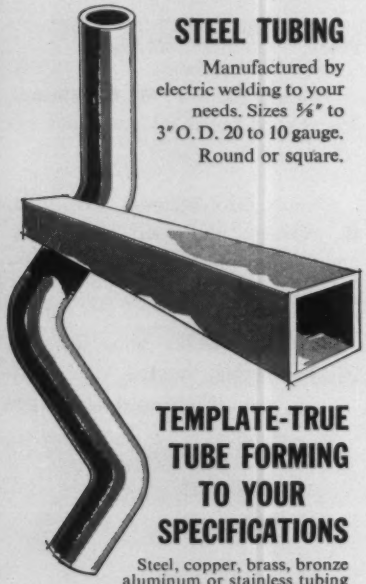

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(Continued from P. 87)

dent, steel foundry products; **J. A. McVicker,** elected vice president, railroad products.

Vickers Inc. — **D. M. Norton,** elected vice president, personnel.

R. S. Wright, elected vice president, International Trade, U. S. Industries, Inc.

Metalweld, Inc., Protective Coatings Div. — **W. R. Wright,** appointed sales manager.

Atlas Steels Ltd.—**H. S. Wilson,** appointed manager, planning.

G. W. Smithson, named chief engineer, Pratt & Whitney Co., Inc., West Hartford, Conn.

Connors Steel Div., H. K. Porter Co., Inc.—**R. J. O'Hara,** appointed sales representative, Birmingham sales district.

The Heald Machine Co.—**C. N.**

(Continued on P. 90)

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This coil-fed Wean "Flying Press" line performs both shearing and blanking operations.

Massey-Ferguson saves up to $9 per ton on material costs with Wean coil processing lines

As a measure of its products' popularity, Massey-Ferguson, Ltd. of Toronto cites the fact that M-F combine and baler production fills every available Canadian railroad flat car twice a year.

Five years ago, Massey-Ferguson's production and purchasing personnel made a thorough cost study of their extensive steel demands, then being provided by shearing from purchased sheets. As a result, three Wean coil processing lines were installed to supply these requirements directly from standard coil.

The three Wean lines are: (1) an edge-trim and cut-to-length line, with a flying shear; (2) a Wean slitting line; and (3) a Wean "Flying Press" line that offers the versatility of straight or angle shearing or blanking of coil stock, all in one machine.

Massey-Ferguson management credits this coil processing system with savings of from $4-9 per ton of metal consumed. And besides the direct production savings in sheet supply, the threat of model-change obsolescence is removed when steel inventory is in coil form.

Many metalworking firms have had similar experience in the profit-making aspects of coil processing equipment. The concept and economics of coil processing are discussed in a new brochure available from Wean. Write for your copy of this informative catalog.

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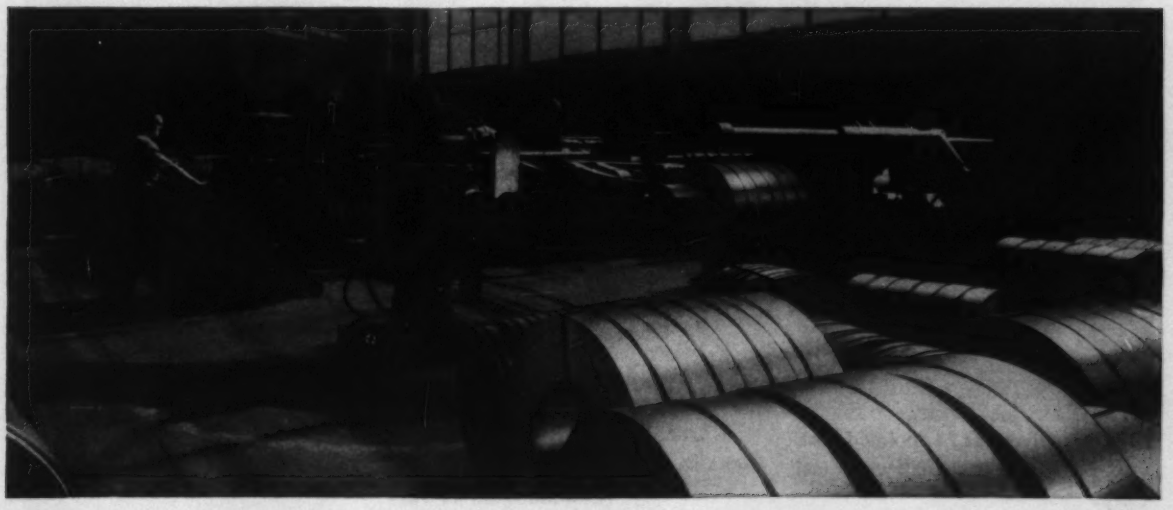
WEAN

Standard coils are slit to a wide variety of widths on this Wean line at the Toronto M-F plant.



(Continued from P. 88)

Hall, named chief grinding engineer.

The Timken Roller Bearing Co., Engineering Div.—**H. J. Urbach,** named director, engineering; **R. E. McKelvey,** named asst. director, engineering.

R. A. Dye, Jr., appointed asst. manager, Bar Sales Div., Cleveland headquarters, Republic Steel Corp.

The Gabriel Co.—**L. H. Davis,** elected executive vice president.

Norwalk Powdered Metals, Inc. —**R. S. Jamison,** appointed vice president.

National Carbon Co. — **F. B. O'Mara,** named vice president, production.

General Drop Forge Corp.—**J. E. Starich,** appointed general manager.

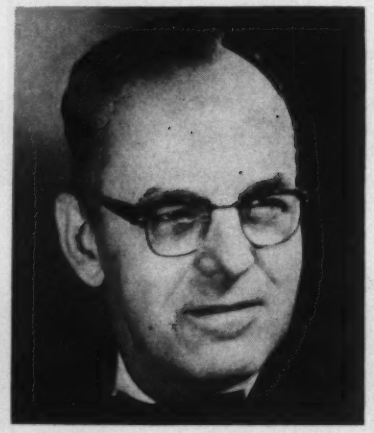
C. W. Diven, Jr., appointed asst. vice president, sales, Sharon Steel Corp.

R. L. Myers, appointed supervising research metallurgist, Armco Steel Corp.

Hooker Chemical Corp.—**C. C. Hornbostel,** elected director, finance.

Aluminum Co. of America—**A. E. Henschen,** appointed manager, Houston, Tex. branch sales office.

Republic Steel Corp. — **John Bridgewater,** appointed asst. sales manager, New York district.



R. S. Pratt, named technical and research director, Bridgeport Brass Co.

The Babcock & Wilcox Co., Boiler Div.—**R. D. Wylie,** named manager, quality control, Manufacturing Dept.

Reynolds Metals Co.—**W. S. Jenkins,** promoted to director,

(Continued on P. 92)

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...cools

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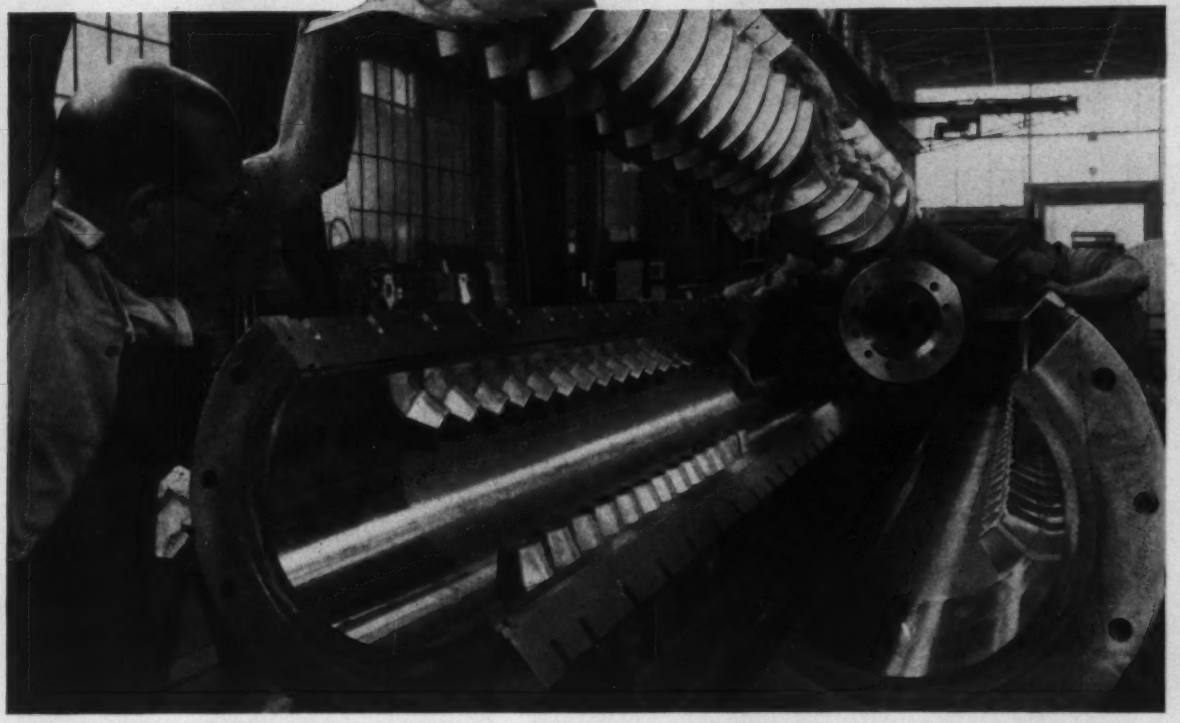

A manufacturer of bakery and chemical mixing equipment was having constant trouble in machining stainless steel components like these.

First, the coolant had to have the "guts" to handle stainless—grades 17-4 PH and 316. A close look at these parts being assembled will reveal the fine finish obtained.

Their biggest problem, however, was rancidity. At least once a week — sometimes twice — they previously had to dump their 800 gal. central reservoir. This cost money!

They tried Hocut 237. The reservoir was filled with a 50:1 dilution and the machines started up—*and they're still using it!* Make-up solution is all they've added since last year!

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FEATURES:

New "Removable" Design — doesn't disturb auxiliary hand-chain operator.

Any Mounting! Vertical or horizontal — on door or wall bracket, or through-the-wall!

Easy Installation. Simple in-the-field control-wiring to a terminal strip.

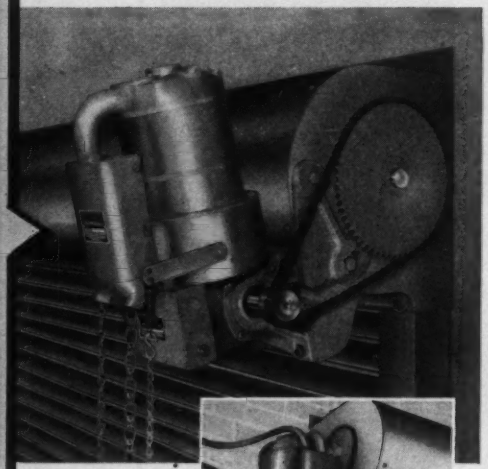
Reserve Power for smooth action regardless of wind pressure, drifted snow, collected grime, or extra years of usage.

Thermal Protection Against Overload — motor cuts out before damage can occur.

New Worm Gearing for highest efficiency and longest service.

Centrifugal Clutch transmits motor action to door with no shock. Prevents motor stalls and overload damage.

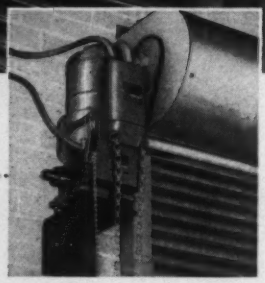
Seven Sizes! Capacities for doors of any size!



MOUNTS ON DOOR

OR ON WALL....

(OR THROUGH THE WALL)



A new high in door efficiency is reached in Kinnear Rolling Doors equipped with the new Kinnear "Series Three" Power Operator. This is an *all-new* concept in motorization for rolling doors — designed with a single goal in mind — to *reduce to minimum* all chance for troubles from overload, torque shock, constant start-stop action—in a motor that assures easiest installation and maintenance, and permits any type of mounting.

The "Series Three" Kinnear Power Operator, like the Kinnear Rolling Door itself, is the finest achievement today's engineering skills can produce.

Write for new Power Operator Bulletin

The KINNEAR Mfg. Co.

FACTORIES: 1760-80 Fields Avenue, Columbus, Ohio
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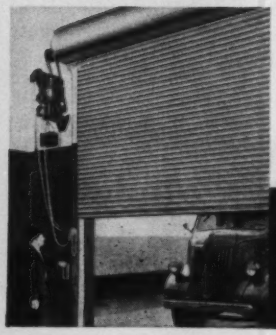
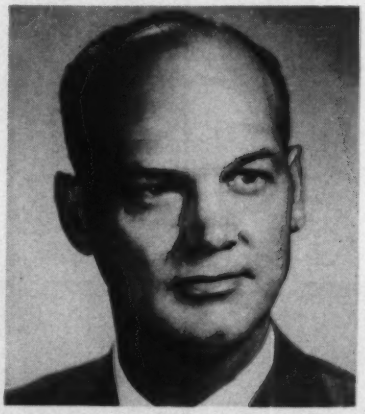
Offices and Agents in All Principal Cities



KINNEAR ROLLING DOORS
Saving Ways in Doorways

(Continued from P. 90)

building products marketing, Richmond, Va., headquarters.



W. J. Burcham, named manager, San Springs, Okla. works, Sheffield Div., Armco Steel Corp.

P. W. Cummins, promoted to manager, product planning and market research, Continental-Diamond Fibre Corp.

Mirro Aluminum Co.—**W. C. Wollum,** appointed manager, Builder Sales Dept.

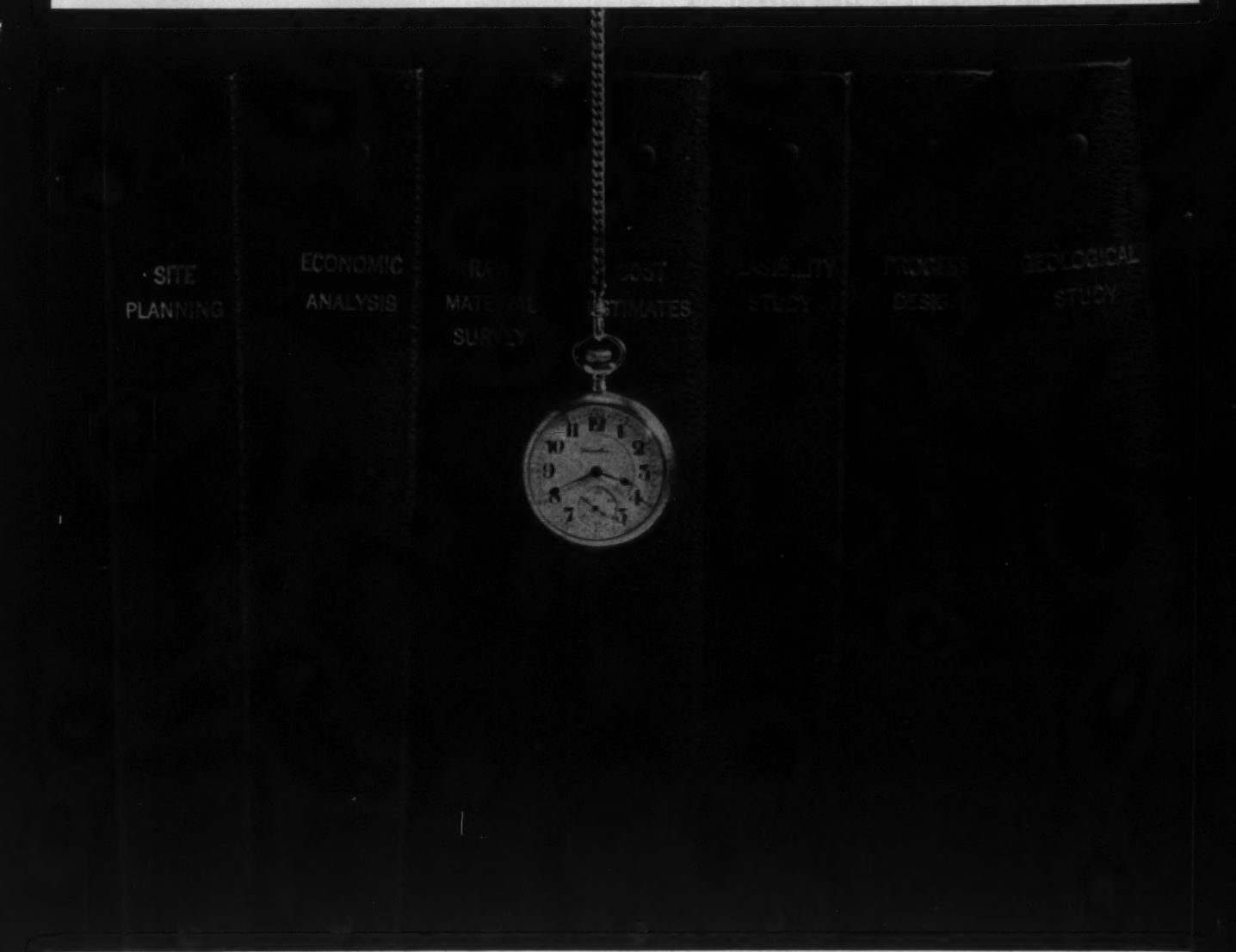
Hardinge Mfg. Co.—**R. L. Johnson,** named foundry manager.

OBITUARIES

H. C. Allington, 61, vice president, sales, Eastern Div., The Colorado Fuel & Iron Corp.

Jonathan Jones, 78, retired chief engineer, Fabricated Steel Construction Div., Bethlehem Steel Co.

Pre-Engineering by **KAISER ENGINEERS** answers basic plant expansion questions...



Timely? Many complex factors shape the final decision to proceed with your expansion plans...and timing is an important one. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. The studies and evaluations furnished by KE Pre-Engineering represent only one phase of total KE services. Kaiser Engineers designs and builds for the Steel industry...offers skilled experience in all types of facilities from raw material plants to finishing mills. From Pre-Engineering through design and construction, Kaiser Engineers provides complete, one-company service and ingenuity based on years of experience.

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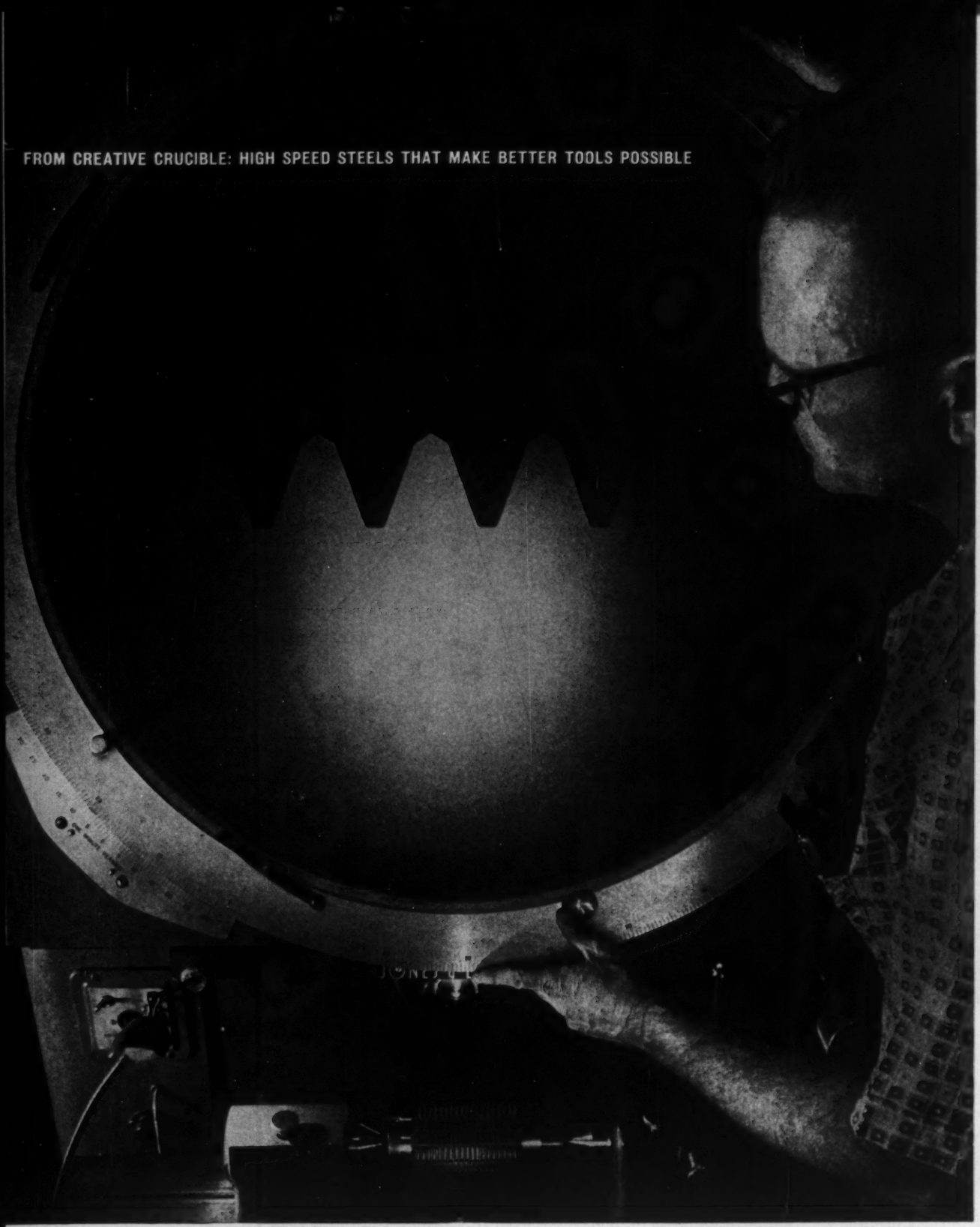
FROM CREATIVE CRUCIBLE: HIGH SPEED STEELS THAT MAKE BETTER TOOLS POSSIBLE



UNGROUND CLASS "C" HOBS, *made from Crucible's M2S, consistently meet runout tolerances as required.*

ACCURATE HOBS— WITHOUT GRINDING!

Toolmakers hold hob tolerances to less than 0.001" without finish grinding—because of improved manufacturing skills and continually improved Rex® High Speed Steels.

Today's toolmakers are not only producing accurate unground hobs to closer tolerances – they're also making them stronger, longer-lasting and with fewer grinding stresses.

What is behind this development? It's the skill of the toolmakers – combined with continuing Crucible developments that improve the quality of Rex High Speed Steels. Crucible tool steel metallurgists, working closely with producers of fine precision tools, are able to devise mill manufacturing practices to provide steels ideally suited to specific applications.

At Crucible, Rex High Speed Steels have always been produced under the close personal supervision of the most experienced men in the industry. Today, these men utilize the most advanced electronic instrumentation to assure the production of highest quality steels. For example, they use precision instruments to control the temperature of the molten metal, in the melting furnace, so each heat is produced under identical conditions. New techniques permit greatly improved deoxidation of the liquid steel. New ingot mold designs provide freedom from segregation when the steel solidifies. And all Rex High Speed Steel billets are inspected ultrasonically before they are rolled or forged.

As a result, Rex High Speed Steels continue to make the best hobs because they offer:

more uniform distribution of carbides throughout the section. This ensures minimum size change, greater predictability in heat treatment, greater hardenability and more uniform hardness in the heat-treated tool:

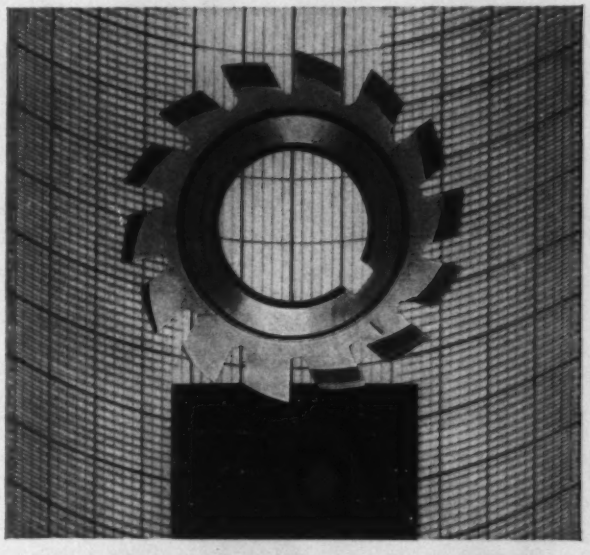
more uniform distribution of sulfides in the free-machining grades. And this provides improved machinability and superior surface finish.

Single-Thread Gear-Hob Tolerances (in Ten Thousandths of an Inch)

	DIAMETRAL PITCH										
	1 Thru 1.999	2 Thru 2.999	3 Thru 3.999	4 Thru 4.999	5 Thru 5.999	6 Thru 8.999	9 Thru 12.999	13 Thru 19.999	20 Thru 29.999	30 Thru 50.999	51 and Finer
RUNOUT											
Outside Dia. C	50	45	40	25	20	17	17	12	12	10	8

Table: Metal Cutting Tool Handbook

FINAL PROOF OF A HOB'S ACCURACY. *This lead variation chart, produced by a special electronic recorder, provides a check of every tooth in the hob. Checks are made "against perfection" — so, any deviation shows up on the chart. Photomicrograph shows tooth area's structure and the uniform distribution of carbides in Crucible Rex M2S. (Photo: 100X dia.)*



BETTER TOOLS, THROUGH BETTER STEELS. *The constant improvement of Rex High Speed Steels ensures the increasingly greater performance of fine twist drills, taps, broaches and cutters — as well as hobs.*

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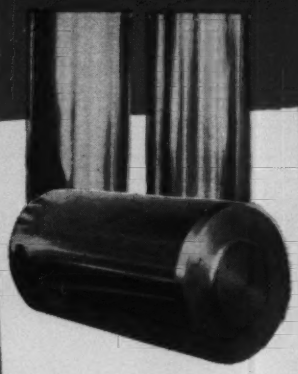
RED CIRCLE Rolls ALLOY-CHILLED

Hyde Park RAMS



for all types of HYDRAULIC EQUIPMENT

Hyde Park Rams are available in Chilled or Alloy Iron.

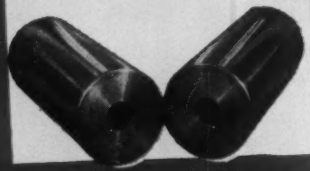
Furnished in hardness range to meet your specification . . . ground to your required size.

On your next replacement of Rams—or for new equipment—consult us. Our engineers will be glad to assist you.

Red Circle Rolls for every Purpose

Rolling Mill Equipment

Gray Iron Castings up to 80,000 lb.



Hyde Park FOUNDRY and MACHINE CO. HYDE PARK Westmoreland County, Pa.

Rolls
Rolling Mill Equipment
Gray Iron Castings

You Arbitrate It!

HOT BREATH

From the files of
The American Arbitration Association

■ John P., an apprentice machinist in an office-machine manufacturing company, knew that if he should be drafted into the army for 2-years' service, he would be entitled to a bonus from his company. This would be paid under a contract clause that read: "Any employee who is required by law to enter the armed forces shall be granted a leave of absence and shall be entitled to a bonus payment in accordance with Schedule A."

"You Arbitrate It!" appears in the second issue of The IRON AGE each month. Look for it in the August 11 issue.

For a while, the prospect of a bonus wasn't of much interest to him, as his draft board kept telling him that he was not likely to be called. Early in 1957, however, he got word that they were soon going to take men in his age group. So John decided the best thing would be to sign up immediately for six months, and then remain in the active reserve for a number of years.

Only a Technicality?—But when he asked for a leave of absence and the bonus, he heard disappointing news. The company was willing to give him the leave, all right, but not the money. "You aren't required by law to volunteer," explained the personnel manager, "so the bonus provision doesn't apply."

"If I don't volunteer now I'll have to serve later," John protested. "So my volunteering is only a technicality. Actually, I'm doing it because I'm required by law to serve, just as the contract says."

Eventually the case went before an arbitrator selected from the panels of the American Arbitration Assn. How would you rule?

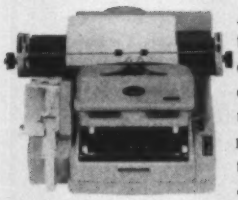
The Arbitrator Ruled:

He found more logic on the company's side of the argument. "The hot breath of the draft board may have been felt rather heavily by the aggrieved employee," he wrote, "but the degree of heat exuded by the draft board is not a measurable quantity." He said that John was not required to enter military service when he did and was therefore not entitled to the cash bonus.

CAUTION: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.

Is punched tape really the best input medium for numerical control?

(3 out of 4 machine tool makers say yes!)



Although 8-channel punched paper tape is only one of several numerical control input media, it is fast becoming the standard. Better than three-quarters of all builders of numerically-controlled machine tools now offer punched paper tape control. Why the swing to punched paper tape? There are three fundamental reasons:

1) Paper tape coding is visible, tangible. You can see it, touch it, and with practice even read it.
2) Paper tape is continuous. Unlike cards, it can't get out of order.
3) Paper tape is easy to program—preparation, verification, and reproduction of tapes are all handled on one inexpensive machine, the Friden Flexowriter® (illustrated).

For the machine tool buyer, standardization on paper tape means great savings. It's so much easier (and less expensive) when *one* input system can control *all* of the numerically-controlled machines in a given plant.

If you're thinking numerical control, you'll be way ahead to think *punched paper tape*.

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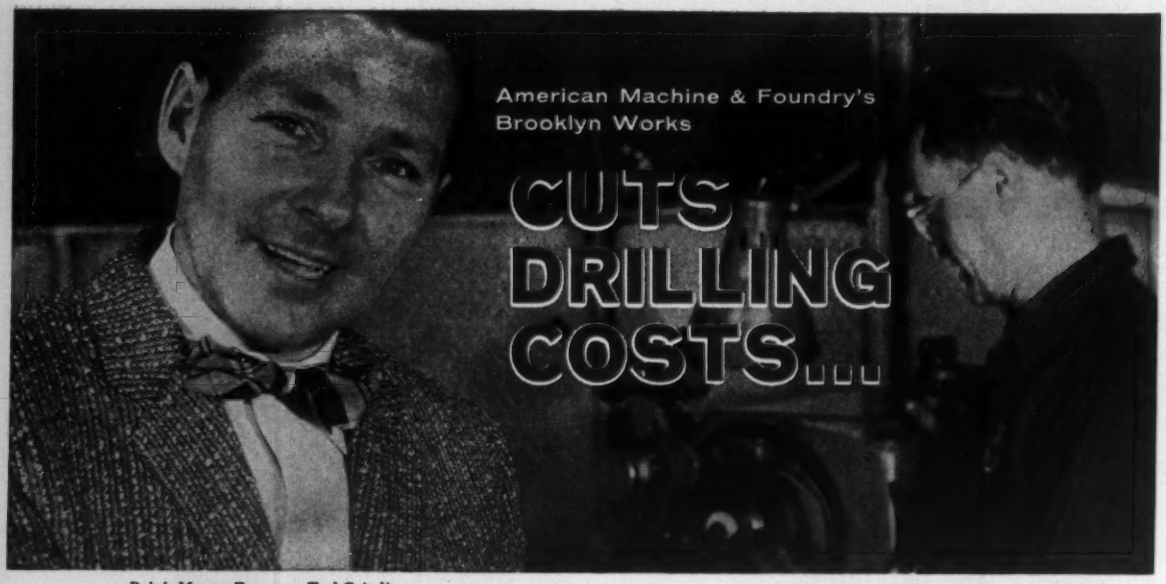
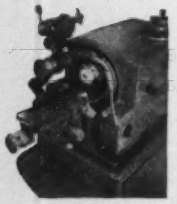


Ralph Mazza, Foreman, Tool Grinding and Small Tool Department



At AMF, the Cincinnati SPIROPOINT sharpens spiral point drills for 10 radials, 60 sensitive drill presses and 20 multiple-spindle multiple head units.

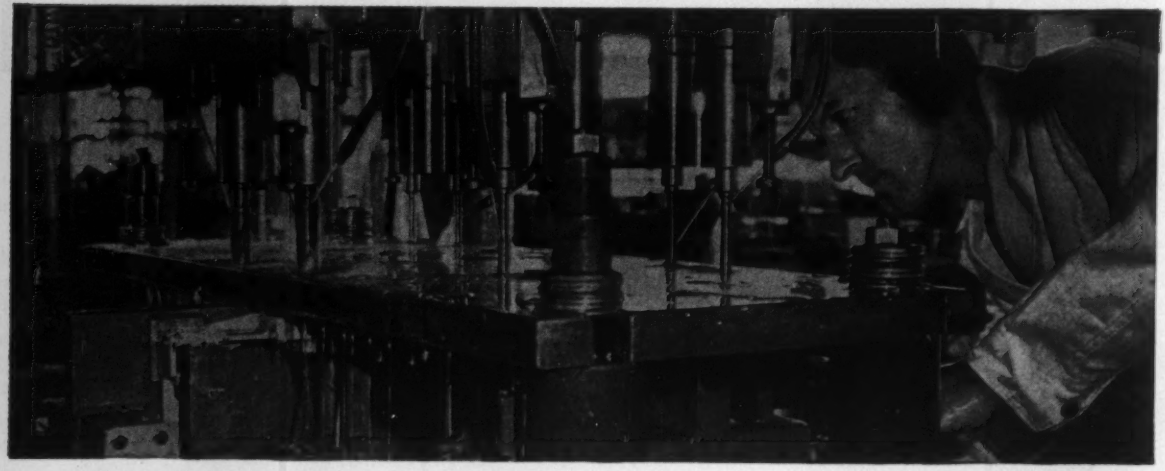
"... 20% more holes per grind"

"... Hole size tolerances of .0015" to .002" on smaller diameters"

"... More than 15% less downtime on our multiple-spindle drilling machines"

"... Less costly fixtures required"

By using Cincinnati SPIROPOINT® Drill Sharpener to apply the new *spiral point* geometry to standard twist drills, AMF reduces drilling costs right across the board—in time, tools, materials, maintenance.

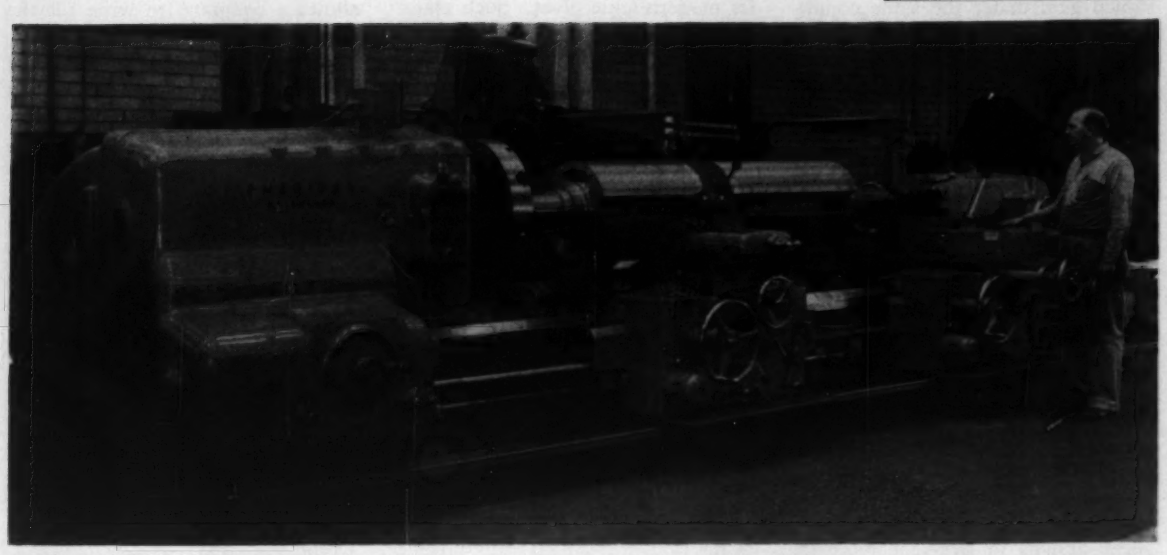


Ask your Cincinnati Lathe and Tool Dealer about SPIROPOINT— or write to us direct.

CINCINNATI LATHE AND TOOL CO.

3207 Disney Street, Cincinnati 9, Ohio

"HYDRASHIFT" Lathes/"CINCINNATI" Drilling Machines/"SPIROPOINT" Drill Sharpeners



POWER TO SPARE: Modern machine tools like this powerful lathe cost quite a bit to purchase. Many users consider leasing as a means of obtaining such equipment—without depletion of capital funds.

Is Leasing the Best Solution To Machine Tool Financing?

By A. C. Nolte—Secretary-Treasurer, The American Tool Works Co., Cincinnati

Leasing of machine tools has enjoyed a flood of publicity. It's often considered a cure that heals all financial ills.

This isn't always true. But when used wisely, leasing can produce worthwhile results.

■ Leasing of capital goods is a new concept in corporate finance. The trade press has treated the subject in great detail. Even though industry has heard volumes of pros and cons, too many authors paint a picture that is too broad in scope.

Now that some accounting firms are specializing in this field, it's time for a down-to-earth appraisal of machine tool leasing. Leasing is no "cure-all" or "wonder drug." It will not heal all your financial ills. Leasing is just another tool. If used wisely, it can improve your operations.

Potential Profit — Here's a vital point to bear in mind: Use (not ownership) establishes the profit potential of your machine. Traditionally, most Americans want to own their equipment. But is this economical? Changing needs for machine tools are not always easy to spot.

To avoid use of some new profit-producing tool simply because the "budget" isn't set up to handle its outright purchase can be a real threat to progress. As a result, the boys who hold the purse strings must sometimes think in terms of bypassing tradition. They should look into leasing. It could lead to greater profits.

The key to success in merchandising is to keep working capital "working." All businessmen put this turnover theory to work. Is capital equipment getting the same treatment? Only by a few experienced financial men.

Study the Problem — Approach the problem from another angle. Capital is needed to start the cycle of cash to raw material to work-in-process to accounts receivable, back to cash again. On this basis, isn't it evident that the final profit depends upon capital-turnover frequency?

There doesn't seem to be any pat method to measure productivity of capital which has been freed by

leasing. Many approaches have shown gain under the same conditions. For example, one method may show rather high productivity while another may show only a low gain. But the point remains: Both show real earnings.

Twenty years ago, a machine tool was a sound investment. You could count on such a tool for many years of up-to-date performance. In those days, the economic life span of a lathe or radial drill was more in keeping with the average useful life tables used by the Internal Revenue Service (I.R.S.) as depreciation guides for tax accounting.

Preclude Obsolescence — Today, you have a different story. Machine tool builders pace their new equipment designs in five-year intervals —to the time of the machine tool shows. A machine installed today may well become "economically obsolete" within a period of a few years.

Today's cash cupboard begins to look a little bare due to present tax burdens. For this reason, a good lease plan can be a real boon to the manufacturer who needs new machine tools to modernize, to expand, or to meet rising production demands.

Several machine tool builders offer modern lease plans. Such plans preclude the need for loans of any duration. In effect, the user can now have the latest available machine tool. With it, a company can speed production, reduce maintenance and upgrade the quality of its work.

Special Problems Arise—Leasing also allows a manufacturer to obtain needed tools for special contract work — or other production items—that couldn't be done properly with existing tools.

In both cases—increased regular production, or contract work—the lessee stands to increase over-all profits. Extent of the increased profits more than offsets the long-range cost increase of leasing. Machine-tool-building technology has rapidly advanced in recent years. It's reached a point which tends to obsolete machine designs faster than ever before.

But bulletin F—the official I.R.S. guide to depreciation and obsolescence — goes on unchanged. It shows the same old "average" depreciation rates of 20 years ago.

Write Off Rental—For this reason, many corporation officers feel that leasing is more economical than buying machine tools. Leasing allows a company to write off the monthly rental.

The tax collector—a recognized part of our economy — is not slighted. Leases do not eliminate taxes. The lessor who owns the equipment pays his share of the tax burden.

Who needs leasing? An industry-wide survey reveals interesting, if not pathetic, statistics. More than 45 pct of the machine tools now in use in the United States were installed prior to 1945.

Installation of modern machine tools brings many benefits to the user. Among these advantages are increased output with lower tooling costs. In one instance two punched tapes and a $450 fixture replaced a $3700 jig. This same equipment replaced the painfully slow practice of using a jig borer for production work.

Here's a Solution — Naturally, precise and automated machines of this type are costly. One solution to the cost problem is The American Tool Works Co. "toolease" plan.

Taking advantage of this plan, prospective users with good credit standings can obtain immediate use

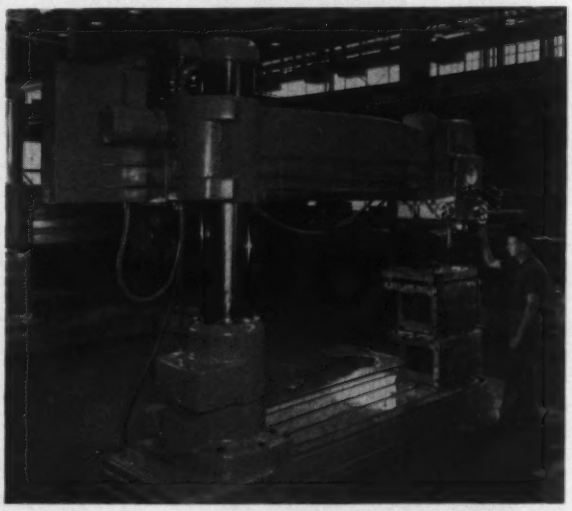
Compare New Equipment Costs

Check each of these methods:

- **Purchase, for cash**
- **Purchase, with bank loan**
- **Installment Purchase**
- **Lease, without option to buy**

Then . . . Compare these factors:

- **Tax Deferral Advantage**
- **Cash-Flow Improvement**
- **Tooling-Cost Differential (existing vs. new method)**
- **Productivity (existing vs. new method)**
- **Maintenance Requirements (old machine vs. new)**



PLENTY OF CLEARANCE: Leasing allows a manufacturer to obtain tools for special contract work.

Check Typical Cash-Flow Patterns

Five Year Lease vs. Cash Purchase vs. Installment

Method of Acquisition	1 Year	2 Cash on Hand (Beginning of Year)	3 Cash Income (Before 4, 5, 6, 7, and 8)	4 Interest	5 Depreciation (Non-cash expense)	6 Rent (Cash expense)
Typical "Toolease" Plan— Equipment Cost: $50,000 Rate: $20.50/$1000/month for first 5 years	First	$75,000	$50,000	.....	.....	$12,300
	Second	98,596	50,000	.....	.....	12,300
	Third	122,192	50,000	.....	.....	12,300
	Fourth	145,788	50,000	.....	.....	12,300
	Fifth	169,384	50,000	.....	.....	12,300
Cash Purchase— Same equipment cost as shown above	First	75,000	50,000	.....	$9,090	.....
	Second	59,227	50,000	.....	8,180	.....
	Third	92,981	50,000	.....	7,275	.....
	Fourth	126,264	50,000	.....	6,365	.....
	Fifth	159,074	50,000	.....	5,455	.....
Installment Purchase— Same equipment cost as shown above 25% down payment, and $37,500 balance for 5 years	First	75,000	50,000	$2,680	9,090	.....
	Second	87,940	50,000	2,090	8,180	.....
	Third	113,190	50,000	1,500	7,275	.....
	Fourth	138,253	50,000	910	6,365	.....
	Fifth	163,126	50,000	320	5,455	.....

Five Year Lease vs. Cash Purchase vs. Installment

Method of Acquisition	7 Income Tax	8 Payments	9 Cash Remaining (3 minus 4, 6, 7, 8)	10 Total Cash on Hand (2 + 9)	11 Comparison
Typical "Toolease" Plan— Equipment Cost: $50,000 Rate: $20.50/$1000/month for first 5 years	$14,104	.....	$23,596	$98,596	(See Footnote for Method)
	14,104	.....	23,596	122,192	
	14,104	.....	23,596	145,788	
	14,104	.....	23,596	169,384	
	14,104	.....	23,596	192,980	
Cash Purchase— Same equipment cost as shown above	15,773	$50,000	−15,773	59,227	$39,369
	16,246	.....	33,754	92,981	29,211
	16,717	.....	33,283	126,264	19,524
	17,190	.....	32,810	159,074	10,310
	17,663	.....	32,337	191,411	1,569
Installment Purchase— Same equipment cost as shown above 25% down payment, and $37,500 balance for 5 years	14,380	20,000	12,940	87,940	10,656
	15,160	7,500	25,250	113,190	9,002
	15,937	7,500	25,063	138,253	7,535
	16,717	7,500	24,873	163,126	6,258
	17,497	7,500	24,683	187,809	5,171

"Comparison" figures shown in column 11 reflect year-end cash availability resulting from "Cash Purchase" and "Installment Purchase" methods as compared to the "Lease" method. For example: at the end of the first year, $39,369 more cash is available with leasing than with a purchase for cash. Figures in column 11 are obtained by subtraction of "Cash" or "Installment" figures from "Lease" figures in column 10.

of the exact equipment needed. There is no down payment. The first rent payment is not due until 30 days after delivery. Under this, or other similar plans, the latest equipment is delivered, installed, and literally pays its own way.

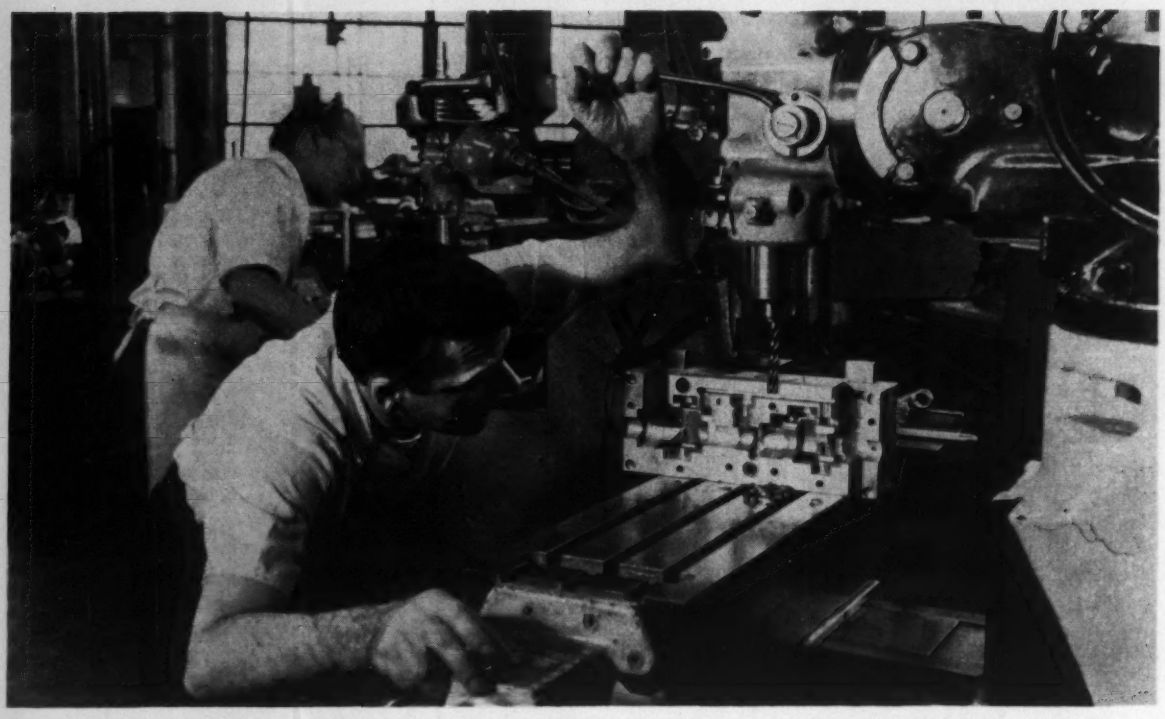
The rate for "toolease" is $20.50 per $1000 of equipment valuation per month. Basic lease term is 5 years.

Keep it Modern—If a user wishes to continue leasing the equipment after the basic 5-year period expires, he may normally do so on a month-to-month basis. In this case, he pays only ⅓ the original rental rate.

In many cases, the user will wish to return leased equipment at the end of the lease period. He'll want to replace it with equipment of improved design.

Leased equipment carries the standard factory service and warranty provisions. Factory representatives, from The American Tool Works Co., are available to lease holders on the same basis as to outright purchasers.

Reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



PREPARE DIE: Toolmaker machines die into which molten wax is injected. Wax is used for complex patterns.

Ceramic Shells Solve Problems On Heavy Complex Castings

Investment castings meet a variety of uses. But size often presents a major problem.

A ceramic-shell process eliminates this problem. Result: 100-lb investment castings.

▪ A new process yields complex investment castings weighing up to 100 lb. These large castings are being turned out in production runs —in almost all castable alloys.

Ceramic shells serve in lieu of solid molds. Investment castings made by using solid molds are limited in size. But the shell-type process, developed by Arwood Corp., New York, produces much larger parts with intricate cores.

Cast Complex Shapes—Designers often turn to investment castings when they need complex shapes —or when parts must be made from hard-to-machine alloys. These castings prove ideal where quantities are limited. They also serve when a design is not finalized or is subject to frequent changes.

Besides these advantages, investment castings do away with costly machining. However, until now, all investment castings have been limited in size.

Arwood's new ceramic - shell process overcomes the size problem. This process turns out castings that weigh up to 100 lb. The ceramic shells will—in the future—produce castings weighing about 200 lb.

Offers Design Freedom — The new process can be used to form shapes which cannot be made by any other means. Good surface finish is also realized. And all castings have fine grain.

There is a wide freedom in design with the shell-type setup. Less finishing is needed than with solid-mold castings. End result is sounder castings.

W. O. Sweeney, executive vice-president of the Arwood Corp., predicts that the ceramic-shell process will expand the use of investment castings. Even with their former size limits, investment castings enjoyed an amazing growth since their birth during World War II. For example, Arwood serves about

2000 customers in 100 different industries.

"Considering how the demand for even small investment castings has grown," says Mr. Sweeney, "it is evident that this new dimension (size) will open up new fields for designers, who can now take advantage of investment castings on large as well as small parts."

Invest Flask—Solid mold-casting methods center on the forming of wax patterns in dies. These patterns are placed in a flask. Then, they're surrounded or "invested" with a ceramic material.

Next, the wax is melted out. This leaves cavities into which molten metal is poured.

Another casting process uses frozen mercury as the expendable material. Liquid mercury is poured into a die, which is then frozen. The caster surrounds the frozen pattern with a ceramic coating. Then he melts out the mercury. This method also forms clean casting cavities.

Both of the preceding methods are useful. But both have a serious drawback. It takes several days for the ceramic-filled flasks to dry.

Fills the Gap — Arwood's new ceramic-shell method fits right in between the other two processes. It fills a long-standing gap in the investment-casting industry.

Here's how it's done. A shell-type mold is made by building up successive ceramic layers around a wax—or wax and plastic—casting setup. The number of layers varies.

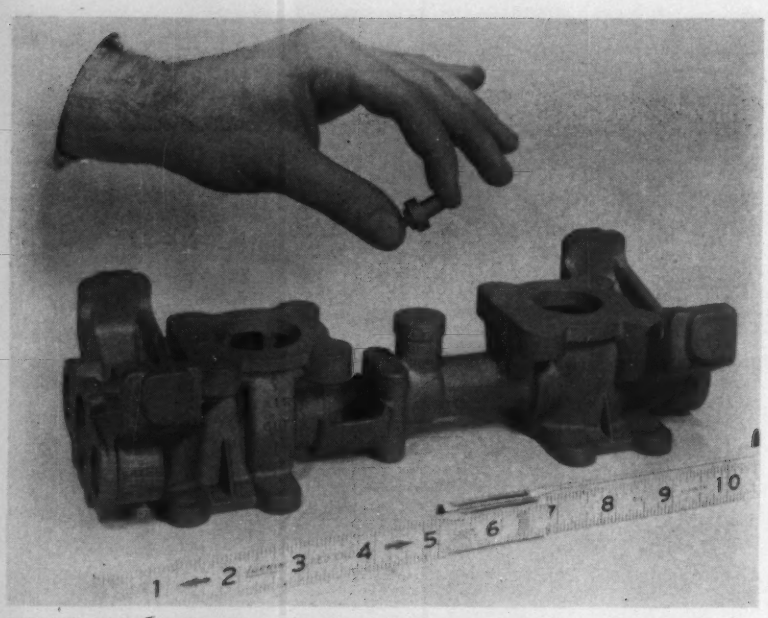
Six layers are often used. They are built up to a total thickness of about ¼ in. The final thickness has to withstand molten-metal pressure during casting and pouring operations.

First, a wax pattern is made from a machined or cast-injection die. One or more patterns are assembled. Each wax pattern may require several machined parts. Runner stock is used to join the pattern's parts. This forms complex casting setups.

(*Continued on p. 104*)

WAX PATTERN: Intricate coring is produced by injecting the molten wax around a water-soluble core. Runner stock joins the pattern's parts.

QUALITY CONTROL: X-ray analysis aids inspector in maintaining quality control of finished castings. Often seven views are radiographed.



FINAL PRODUCT: New ceramic-shell process provides intricate contouring in complex shapes. Each shell-type mold is formed by ceramic layers around a wax pattern. Casting sizes range up to about 100 lb.

PATTERN DIP: Wax patterns are stuccoed with a finely divided refractory material. Successive dips build up several layers of the ceramic. Stuccoing takes place right after dipping—while pattern is still wet.

Uniform Coating — Each wax pattern is then processed. The assembly is dipped in the primary refractory-ceramic slip. When it drains, a uniform coating results. This produces a cover of fine refractory grains.

Drying takes place in a controlled temperature-humidity area. Drying time varies from 1½ to 2 hours.

Secondary or backup coats can now be applied. The caster dips the pattern into a backup-ceramic slip. He drains the pattern to obtain a second thin coating.

The pattern is covered again—this time with a coarse refractory grain. Then it's dried once more. Dipping, draining and drying are repeated as often as needed until the desired thickness is obtained.

Ready to Fire—Finally, dewaxing and shell firing occur. After final drying, the shell is dewaxed at 1800°F. The shell is next fired at 1600°F for 30 minutes.

All shells are removed from the preheat oven and positioned for casting.

Two 50-lb capacity ladles serve in the casting operation. Each mold can be cast directly from the firing oven. Or it can be cooled and reheated just prior to pouring.

After it cools, the casting is cleaned, cut off, heat treated and finished in the standard manner.

Choose Best Method—Ceramic-shell castings are being made at all five of Arwood's plants. These plants are located in Brooklyn, N. Y.; Groton, Conn.; Tilton, N. H.; and Los Angeles and La-Verne, Calif.

With this new ceramic-shell process, the Arwood Corp. is able to use all three investment-casting systems. Experience shows: "There is no best system or method for doing all casting jobs."

Very often there is one optimum method for doing a certain casting job. Since Arwood handles all three types of castings, it can readily select which process to use.

Microfilmed Drawings Save Space

Automated Photocopying Unit Supplies Reprints on Demand

Record departments bite into the budget to meet the constant demands for reproduced drawings.

To save time and space, consider an automated filing system and photocopying unit.

■ The need for more space is always a problem facing today's plant officials. Many companies are resorting to microfilming their drawings for application to IBM aperture cards.

The aperture card reduces storage space needs as much as 50 pct. Reproduction of the cards has been simplified with a new fully automated photocopier. To cite an example of just how time and space can be saved, consider the former problems of The Norton Co., Worcester.

Compact System — Like many other metalworking companies, this manufacturer embarked on a project of microfilming its engineering drawings to insure safe, economical storage and ready availability.

The system worked fine—up to a point. With more than 200,000 drawings in the vault of its Machine Tool Division, the company estimated it would save at least 50 pct in storage space by microfilming these documents.

This part of the plan worked out very well. Relatively inactive tracings were placed on 35-mm microfilm aperture cards. For the time being, the company left more active drawings intact.

Space required for storage of microfilm aperture cards is 1/32nd that needed for the original drawings. The microfilming of the inactive material alone resulted in the 50 pct space saving.

Major Problem — This solution to storage needs contained a problem in itself. When the microfilm storage system is used the only source of reproduction is the microfilm.

Making enlargements was time-consuming and frequently created a "dead time" situation for production and engineering operations.

At this point, the company turned to the Photostat Corp., Rochester, N. Y., for help in solving its problem. This firm, specializes in projection photocopying and procedural microfilming.

New Unit—Photostat closed the gap in the Norton Company's microfilming system with an automatic unit called the Photostat Photocopier. The machine is completely push-button, operated from a small control cabinet that can be placed at the convenience of any operator. This copier uses a microfilm enlarger attachment for 16-mm or 35-mm film.

Exposure, cutting of the sensitized paper from the roll to the length desired, developing, fixing, washing and drying of the finished print, are accomplished merely by pushing the exposure button on the control cabinet.

Any size reproduction of engineering drawings up to 18 x 24 in. can be made. If multiple prints are needed, the machine can make up to 120 an hour of the largest size merely by pressing a button on the pre-set cycle control.

Time Saver — The Photocopier cuts enlarging time from several hours to a matter of minutes. Changes in originals and reference to old engineering drawings present no problem. The reproduction department is able to give quick delivery of enlargements.

COMPLETING THE CYCLE—The photocopying unit enlarges microfilmed engineering drawings to any size up to 18 x 24 in. Insert a microfilm aperture card into the unit and obtain 120 copies per hour.

Ratio Systems Give Management The Tools for Big Decisions

By **S. A. Tucker**—Partner, Martin & Tucker, Little Neck, N. Y.

Why should top management get buried in minute details? It's a waste of talent.

Know the pulse of your business—then chart its course with confidence.

■ It's mighty tough to manage a successful business in this day and age. To survive, you must bear the brunt of pressure from competition and adjust to many growing complex methods. Every company has its economic eye open to material costs and wages. But how about the economies that exist in the tiny, subtle and elusive areas of manufacturing?

Real strength is generated from four areas. These include optimum productivity, proper use of capital, rapid expense recovery and the ability to penetrate the market. As soon as these factors start to blend and support one another, then your profit pattern broadens.

Overload—But management must do much more than just direct and coordinate these functions. It must have the means to spot hidden areas of profit or loss. Creeping changes must be recognized. And good management has to think about the future. What paths should be taken for company growth?

Management tries to cope with the currents of events and data. But its tools are weak. Some are misleading. Reports engulf the desks. Before long, management is bogged down in minute details. Perspective becomes clouded and judgment is no longer clear.

How about the reports that management does see? They're "after the fact." They are not timely. Too late. Not pre-digested.

Pot of Gold—The burden of pressure on today's manager is unfair. When confronted with the usual data, he seldom knows where to begin. A decision in one area might create grave impact in some other area. So, if a manager does "strike gold" in a decision, it's by accident. Not by design.

To put out a fire, a decision is often made in one area. And such a decision often leads to disaster. Take the company that decided to cut payroll by reducing material handlers. This move resulted in a pile-up of work-in-process and heavy dollar tie-up in inventory. Rejects went up and cash flow became impeded.

Worker productivity did remain high, as did sales pressure. But the overall effect on the plant just made matters worse.

The New Line—Another company toyed with the idea of replacing an old production line with an automatic setup. Management knew that such a move would double pro-

PLANNED PROFITS

This is the first of a four-part series of articles on planned profits.

Next week, Mr. Tucker will take up the subject of evaluation and control of production.

The following weeks will cover the evaluation and control of sales and of capital and integrated evaluations, respectively.

Analyze Before You Buy

Can you book enough new sales to absorb increase in capacity?
Will added sold capacity mean more estimators, more clerks?
Will the cost be affected by alternative methods of financing?
How will the inventory portion of current assets be affected?
How about the effect on the company's capital position?
Who will service the equipment? Outside specialists?
How costly is the breakdown-downtime per hour? How often, too?
What is the average set-up cost of the new equipment?
Will changes in product mix affect tooling and set-up costs?
Is there enough plant space to store added inventory?
Is a bigger indirect labor crew needed to support the system?
Suppose you double production. Where will you pass the savings?
Will sales be sufficient to maintain the previous profit level?

duction and reduce direct labor costs by 75 pct. Also, savings from direct labor alone would pay for the new equipment in nine months.

Are these facts enough to justify the decision? Not by a long shot. In fact, management is shallow if it thinks these facts form the basis of a sound decision. Other vital points must be considered, too.

Wherever products are made decisions are also made. Behind the scenes data are constantly in a state of flux. Something happens every second on every square inch of company property.

Facts Wanted—Management can do something about these changing conditions. It can get the vital facts, weigh these facts, and then interrelate them to test their impacts elsewhere in the company. Only then can action be swift, secure and objective. This tool is provided by the managerial controls (or MC) technique.

The heart of MC is in its living ratios. These are derived from previously unrelated data gleaned from company records. The trick is to give economic meaning to that maze of facts and events in sales, production and capital areas.

With MC, management can know the broad effect of a decision in advance. This technique maintains a continuous reading of the business pulse. As a result, management is freed from the shackles of endless details. It can move on to more fruitful jobs.

Secret Formula — When a piece of unrelated data is compared to another which it affects or which affects it, a ratio is created that imparts meaning to both pieces of data.

What are these ratios? Downtime means nothing unless it is compared with machinery running hours. Another example? Maintenance expense by itself is worthless data until it's known how effectively the maintenance was used.

The same is true of sales data. The number of dollars booked is really not a proper measure of a salesman's performance. You must consider the number of contacts or customer potential or quotation mortality. Other factors include the expense level, the amount of new business or new product activity.

Selling Points—Look at the difference between the man who quotes for sizable orders and the salesman who requests quotes on the tiniest of orders. They both may sell the same amount in dollar volume. But the second man will incur more field expenses. And he'll build up a higher internal transaction cost, too.

A profit earned from operation hasn't enough meaning unless it's related to the tools which made the operation possible—the assets. This would show management the return on its total resources. Profits should also be compared with the company's net worth to show stockholders the return on their investments.

Compare sales with the company's fixed assets and you get a look at the vitality of the equipment. In other words, its ability to produce income.

Extensive—To appraise the effect that sales might have on production or capital, other ratios can be constructed. To test the effect of changing product mix, one company interrelated six factors.

They included press running time, make - ready hours, quotational costs, speed of overhead expense recovery, inventory investment and current liabilities. The plant soon arrived at an optimum mix. And it gave the company its greatest profit-making combination consistent with a sound state of financial health.

Find Profits With Formulas

Name of Ratio	Formula
Overhead Load	Overhead Cost / Running Hours
Productivity-Economy Index	Incentive Premium Hours / Cost of Maintenance and Rework
Quotation Mortality	Cumulative Quotations and Sales / Cumulative Quotations
New Business Attempts	Quotations to New Contacts / Total Sales Booked
Working-Capital Density	Inventory / Working Capital
Fixed Capital Utilization	Fixed Assets / Net Worth

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How Hydrides Solve Problem Of Forming Metal Parts

By **J. D. Roach**—Titanium Alloy Mfg. Div., National Lead Co., Niagara Falls, N. Y.

No longer lab curiosities, metal hydrides—particularly of zirconium and titanium — are finding wide applications in industry.

It's all tied up with their ability to evolve hydrogen.

▪ Certain metals have the unique ability to absorb large quantities of hydrogen—and then to give it up just as easily. Two metals that excel at this reversible reaction are titanium and zirconium.

In the combined form, these materials—known as hydrides—are not just lab curiosities. They play a vital role in such diverse tasks as making foamed aluminum and bonding glass or ceramic to metal. A major use is for making powder metallurgy parts of titanium and zirconium.

Hard-to-Get Powders — In the past, the use of powder metallurgical techniques for making titanium or zirconium shapes was hampered by the unavailability of high-purity powders of these metals.

Grinding high-purity crystal bar or sponge is impractical because of the high ductility of these materials. But the hydrides of these metals are very brittle. They can be readily powdered; and the desired purity can still be maintained.

Moreover, since the hydride can be readily decomposed to the metal at high temperatures, it is an excellent choice for powder techniques.

Sinters in Vacuum — Because these metals have a high affinity for oxygen and nitrogen, they should be sintered in a high-purity inert gas or vacuum. Vacuum sintering is preferred since dehydriding and sintering can be achieved simultaneously.

Decomposition of the hydride during the sintering process results in a rapid sintering rate. This means that lower compacting pressures and temperatures can be used when sintering metal hydrides.

Making titanium or zirconium-base alloys by powder metallurgical techniques is eased by use of the hydride powders. Why? Prealloying of the hydride is possible. This means that the composition of the starting alloy will—aside from hydrogen content—correspond to the alloy desired in the final product.

Thus, there will be no need for a lengthy and often unsuccessful homogenization treatment as is required when unalloyed powders are used.

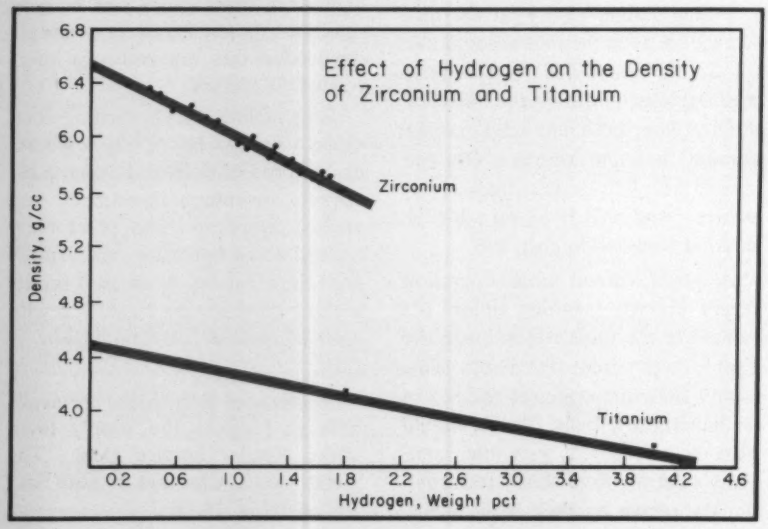
Two Difficult Jobs—In the field of joining, two of the hardest jobs are the bonding of metals to ceramics, and the making of vacuum-tight glass-to-metal seals.

The former requires a metal which can wet the metal and ceramic equally well. Metals such as titanium, zirconium, tantalum, and niobium have this property. They can produce very strong bonds between metals and many non-metallic materials.

Glass-to-metal seals require a bonding metal whose thermal expansion properties match those of the glass. In many cases, the expansion traits of titanium and zirconium are close enough to those of some glasses.

Hydrides of both these metals have been used in making ceramic-to-metal or glass-to-metal seals. Ease of handling, the dehydriding traits, the hydrogen given off, and

Hydrogen Expands Lattice



the resulting highly-active metal powder are all key factors in making strong, sound bonds.

Takes a Thin Coat—How are these hydrides used for bonding? First, the surface to be joined must be coated with a thin film of the hydride suspended in water or a nitrocellulose binder. Then cover the hydride with a suitable solder or brazing alloy to provide the fill material. Finally, heat the assembly in a vacuum or inert atmosphere.

During the early stages of heating, the hydride decomposes leaving a thin layer of finely-divided active metal on the surface. As for the freed hydrogen, we believe that it cleanses the metal and ceramic sealing surfaces.

As heating continues, the brazing filler metal melts and alloys with either the titanium or zirconium. Thus, it produces a strong, vacuum-tight bond.

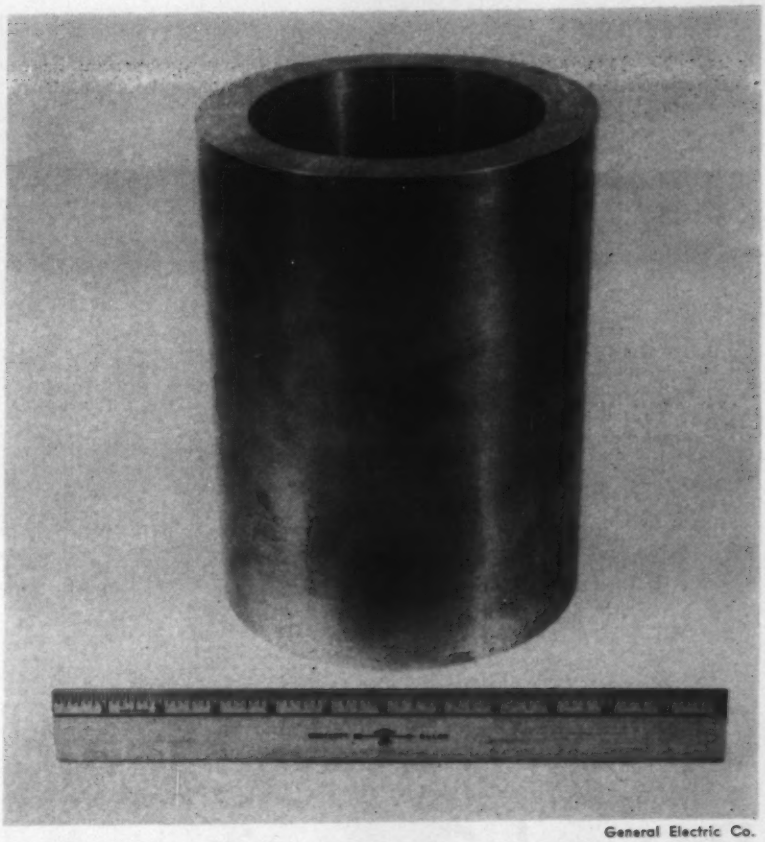
Advantages of the hydride bonding process include: strong bond; fast cycle; only one firing operation; excellent reproducibility.

Makes Foamed Metal—A recent use for metal hydrides is for making foamed metals such as foamed aluminum. Aluminum made by this technique is very light. It has a density of only 20 lb per cu ft.

This unique metal is made by adding a gas-forming solid to a melt of the metal to be foamed. The nature of the gas-forming solid should be such that gas comes off at a temperature slightly above the melting point of the matrix metal. The evolved gas which does not have time to completely escape from the melt gives rise to a sponge-like or foam metal.

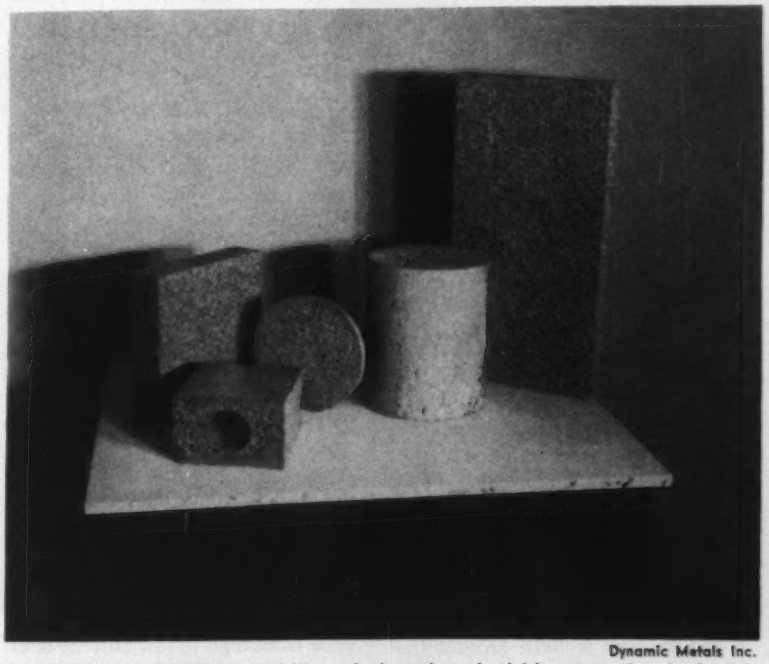
Hydrides of titanium and zirconium, preferably the latter, are ideal gas-forming solids. Reason: the reversible reaction of these compounds with hydrogen.

This method of making a foamed metal by using hydrogen freed from a metal hydride may be applicable to metals other than aluminum. The rare earth hydrides may be useful towards these ends.



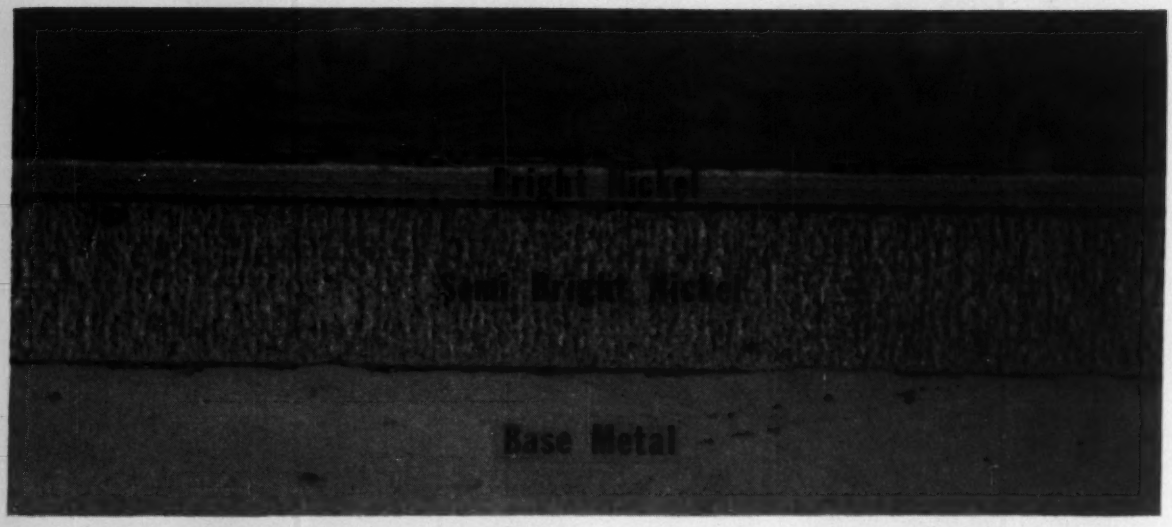
General Electric Co.

MADE FROM POWDER: Teaming up of powder metallurgy techniques and brittle hydride results in product like 10-in. high Zircaloy-2 billet.



Dynamic Metals Inc.

GAS FOAMS METAL: Ability of zirconium hydride to evolve hydrogen gas is vital to forming of the new foamed aluminum material.



TWO NICKEL LAYERS—A cross-sectioned specimen is mounted in bakelite. The N2E process forms a very stable columnar-structured semi-bright nickel. The upper bright layer provides the final touch.

Double Nickel-Plated Layers Retard Corrosion, Add Life

By **L. V. Nagle,** Executive Vice President—The Udylite Corp., Detroit

Nickel plating is the basis behind good chromium finishes. Perfect the nickel plating process and the chromium will last indefinitely.

Here's one approach that has really caught on.

▪ A semi-bright nickel plating process that produces a sulfur-free deposit, is now in production at the plant of a large auto maker. The process, designated "N2E" by the Udylite Corp., Detroit. It provides simplicity of operation, consistently uniform deposits, ease of control and many economical advantages.

The process is built around the use of two new liquid brighteners, "2N" and "E." Corrosion problems that once harassed manufacturers are now under control. Product life expectancy is greatly increased.

The N2E process has no harmful breakdown products. Breakdown products are organic materials that have been oxidized or reduced through the process of plating. Their necessary removal often results in loss of solution, wasted manhours and use of additional chemicals.

Uniform Plate—Recessed areas on parts of irregular shape are unavoidably low current density areas; protrusions are high current density areas. Non-uniformity of appearance from high to low current density areas was once common.

However, the N2E process overcomes this problem. Organic in nature, the unique agents are proprietary materials covered in process patents.

Because they are non-critical in concentration, they may be added to the solution in greater or lesser amounts than recommended without serious trouble. If a greater quantity is added, for instance, the only adverse results will be a slight loss of ductility and a slight increase in operating costs.

Wide Current Range—The average current density range is 30 to 60 amps per square foot. This wide range permits work to be plated in a reasonable time at a high average current density without burning, thus increasing thickness in recessed areas.

Much of the work plated today is made of zinc-base die castings. If die castings which fall to the bottom of a tank remain there for any length of time, the zinc will slowly dissolve. The result is contaminated bath.

The high stability of N2E addition agents allows the economical use of purification by low current density electrolysis. This is a practical way to remove metallic and organic impurities, thus insuring a high quality deposit in low current density areas.

Good Adhesion — Faulty adhesion between nickel layers on zinc base die castings is frequently caused by failure of a semi-bright nickel to cover completely the areas of very low current density. The unusually good coverage obtained from the N2E Process eliminates adhesion problems of this nature.

Proper adhesion between nickel layers depends to some degree on the bright nickel process used for the second nickel layer. Udylite's #66 fully-bright nickel process has proved to be exceptionally good in this respect.

Continuous filtration of a nickel bath through activated carbon removes air borne contaminants, foreign materials introduced from improperly cleaned work as well as harmful breakdown products. Often, a carbon pack also removes brighteners in large quantities, making its use economically impractical.

A carbon pack is used with N2E to advantage. These brighteners are not removed and the cleaning action of the filtration through carbon results in longer operation without quality variation.

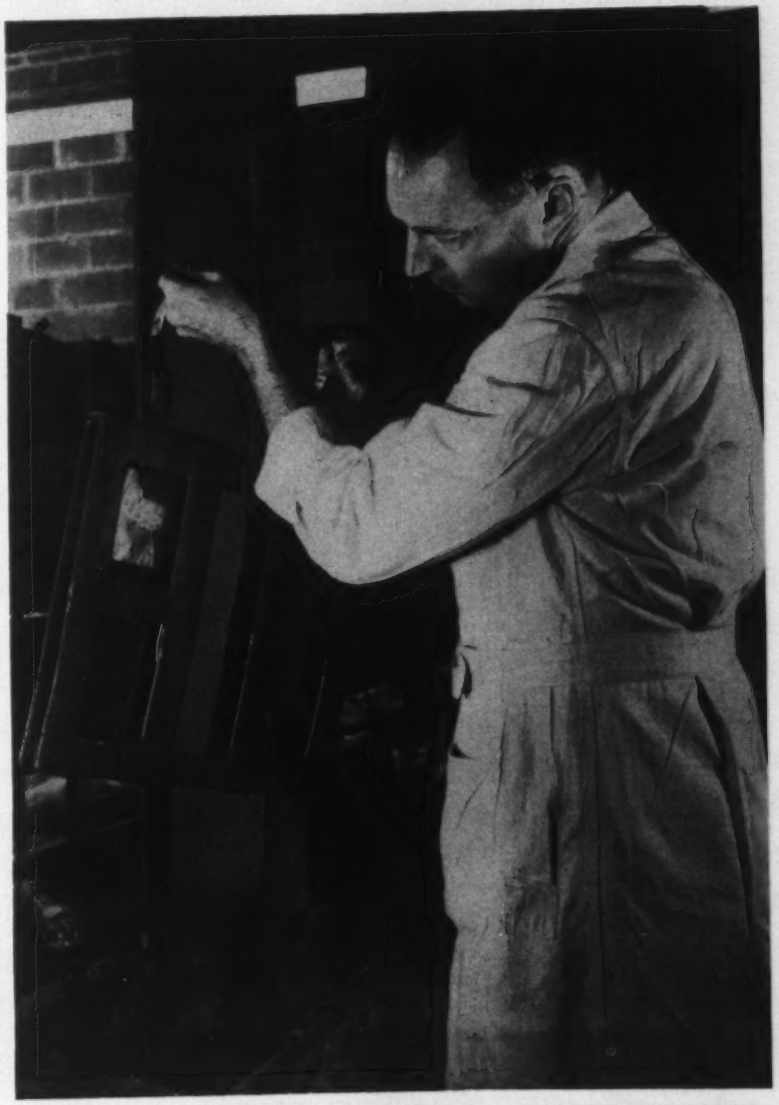
No Air Needed — The process does not require air agitation. Since operating costs decrease with the use of agitation, it is recommended. The air agitated bath consumes less brighteners and permits plating at higher speeds.

N2E can be applied in any plating sequence in which other semi-bright nickel processes are used. It easily withstands bath temperatures up to 150°F for high speed plating. The deposit can be buffed easily and is unusually receptive to bright nickel deposits.

The appearance of the work also depends on the bright nickel overlay. Udylite's Bright Nickel Process #66, already well-known in the plating industry, has proved extremely satisfactory in combination with N2E. While the #66 process is one of the simplest to work, N2E is even easier to operate.

Used on Autos — The process was used on 1960 automotive parts and found consistently high in uniformity regardless of the shape of the parts.

Five major areas of extra savings result with the use of the N2E process. They are as follows—no batch treatments, consistent uniformity, less rejects, higher operating temperatures, and direct additions of brighteners.



NICKEL BATH—Elimination of breakdown products in the bath decreases the need for costly batch treatments. An activated carbon pack placed in the solution filter economically removes contaminants.

Tape Controls Speed Short Runs

Machine Drills, Bores, Mills and Taps Heavy Castings

Automation often has one major drawback—it takes a lot of time to make setup changes.

Tape controls help a new machine do the work of several single-purpose tools.

■ A great challenge that faces American industry is the proper use of automation. Why? Because cost and quality advantages of automation must be coupled with a means of quickly changing production runs.

Here's a positive step toward that goal. A new machine tool automates vertical drilling, boring, milling and tapping of large castings. Some of these castings weigh up to 3600 lb. Short work runs are common.

Called the Versa-Tronic, the new unit, made by the Lucas Machine Div., New Britain Machine Co., Cleveland, works to repeatable accuracies of ±0.0002 in. A General Electric numerical-positioning device controls all functions of the machine.

Handle Short Runs — H. N. Stephan, vice president and general manager of the Lucas Div., reports that the new machine has twice the range of present vertical spindle units. He says that a Versa-Tronic will do more than 80 pct of all job-shop work.

"The Versa-Tronic is both an example and a product of the growing trend toward flexible automation in metalworking," says Mr. Stephan. "It is especially designed to reduce the overall machining-time cycle in medium- and short-run production," he adds, "where flexibility is needed from lot to lot."

Basic design consists of a long cast bedway. Two columns are attached to the bedway's center.

Fast Setups—The columns guide and support a cross-rail which moves 72 in. This vertical movement parallels the table below.

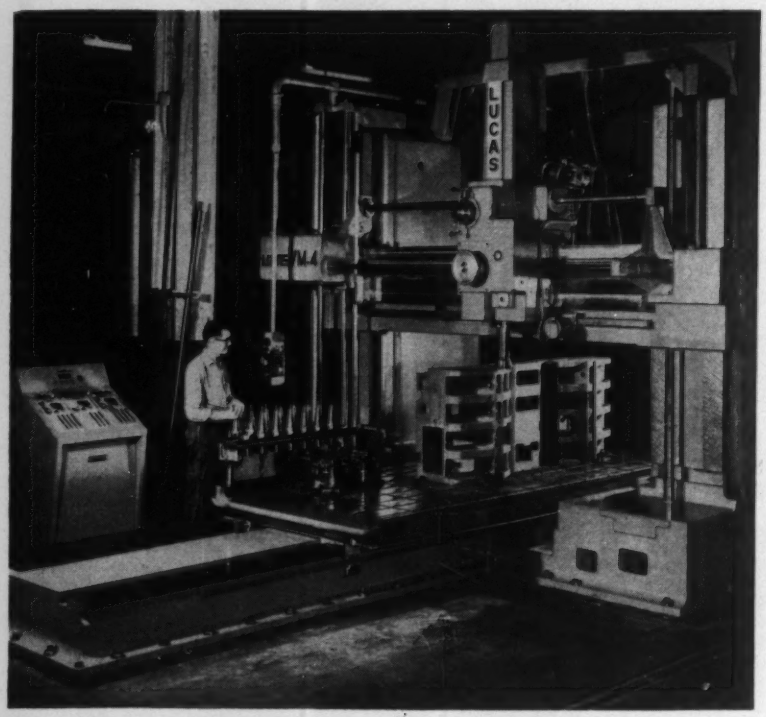
Large-face milling cutters—up to 14-in. diam—can be mounted on the nose of the spindle sleeve. Smaller milling cutters, boring tools or drills fit in the taper of the sliding spindle within the sleeve. The sliding spindle has a 24-in. travel.

Precision screws, with micrometer dials, speed accurate hand settings. They control the following movements: longitudinal table travel; vertical cross-rail travel, crosswise spindle-head travel; and vertical spindle travel in and out of the sleeve.

Vertical adjustment of the cross-rail is arranged with dial indicators. This allows the use of precision end-measuring rods which locate the unit to jig-boring tolerances—through automatic-positioning control.

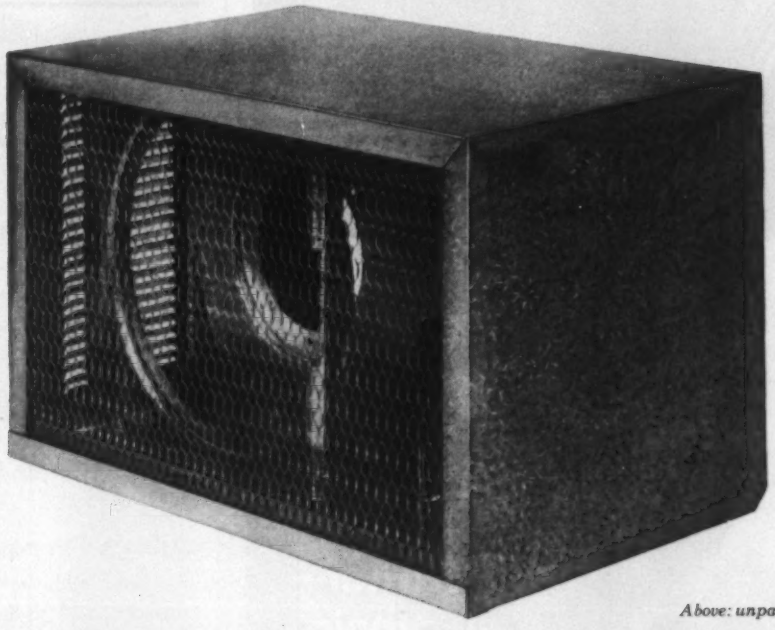
Tight Tolerances — Accurate alignment of the machine permits close tolerance milling. Vertical travel of the cross-rail on the columns is within 0.0005 in. Crosswise travel of the cross-rail's spindle head is held within 0.001 in. over its 78-in. travel. Sweep from spindle to ways is within 0.0002 in. per ft.

The manufacturer believes that the market for the Versa-Tronic will be as wide as the metalworking industry itself. "The machine can take the place of three or four single-purpose tools usually found in machine shops," says Mr. Stephan.



VERSATILE UNIT: Numerical controls order tool changes, alter feed rates and vary the working patterns. Memorized "habit patterns" can even replace interim tape readings. Result: Rapid production changes.

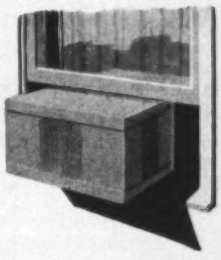
Better Products Through Better Methods and Steels



Above: unpainted air conditioner cabinet

How modern zinc-coated steel sheets keep air conditioners weatherproof—season after season.

When cold-rolled sheet steel formed the cabinets and special drawn base pans of air conditioners, they were primed and painted inside and out to protect them from constant exposure and functional moisture. Even so, corrosion often took hold around fastenings, louver edges and scratches.



Now that Weirkote continuous-process zinc-coated steel is used, the cabinet, louvers and chassis can be cut, bent and formed (even worked to the limits of the steel itself) without chipping or flaking the corrosion resistant zinc surface. When the outside paint finish is applied (primarily for decoration) the air conditioner has the double protection of a coating of paint and a coating of zinc assuring corrosion-free service for many years to come.

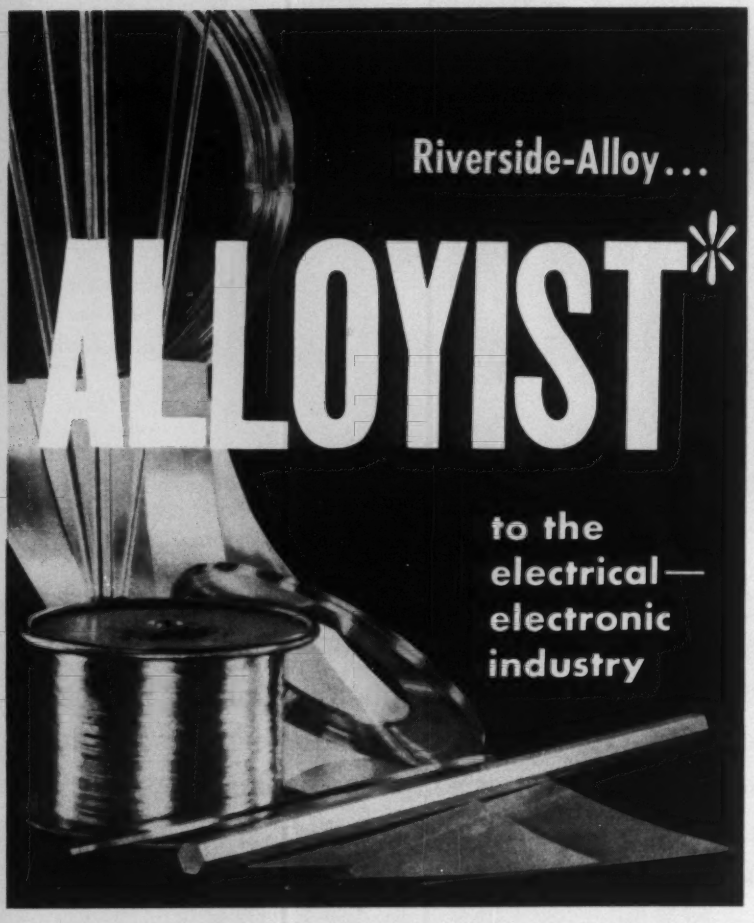
It's because of this weather-shedding surface, this superior formability that continuous-process zinc-coated steel is more and more the metal specified for air conditioning, heating and ventilating equipment.

A major supplier: Weirton Steel Company—producer of Weirkote continuous-process zinc-coated steel and many other steels that improve products, methods and profits throughout industry.

WEIRTON STEEL
Weirton, West Virginia

Weirton Steel is a division of **NATIONAL STEEL CORPORATION**

Weirkote will also be available in 1961 from National's Midwest Steel Division, Portage, Indiana



*ALLOYIST—Our own almost-Websterial word, meaning: a single reliable source for strip, rod, wire and flat wire to serve your every need.

*ALLOYIST—A single, reliable source for nickel, nickel silver, cupro nickel, stainless steel, phosphor bronze, Monel** and Inconel**.

*ALLOYIST—A supplier of metals whose manufacturing processes are often exclusive, and *always* the most advanced, to insure total product superiority.

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PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

PATENT REVIEW

New Patents In Metalworking

Refined Iron

Metallurgical refining process, J. D. Madaras, June 7, 1960. In a method for refining sponge iron, whereby the iron is separated from accompanying gangue elements, the iron is fused and pelletized. The gangue is then slagged with a suitable fluxing agent. The refined iron does not undergo reoxidation. No. 2,939,782.

Alloys Ferrous Melts

Alloy addition agent, E. R. Saunders and R. L. Pope (assigned to Union Carbide Corp., New York), May 3, 1960. An improved non-exothermic alloy addition mixture alloys ferrous melts. The mixture comprises 20-70 pct each of 20-200 mesh aluminum and medium-carbon ferromanganese, up to 5 pct of fluorspar or other fluxing agent, and 1-5 pct of a wood rosin binder. No. 2,935,397.

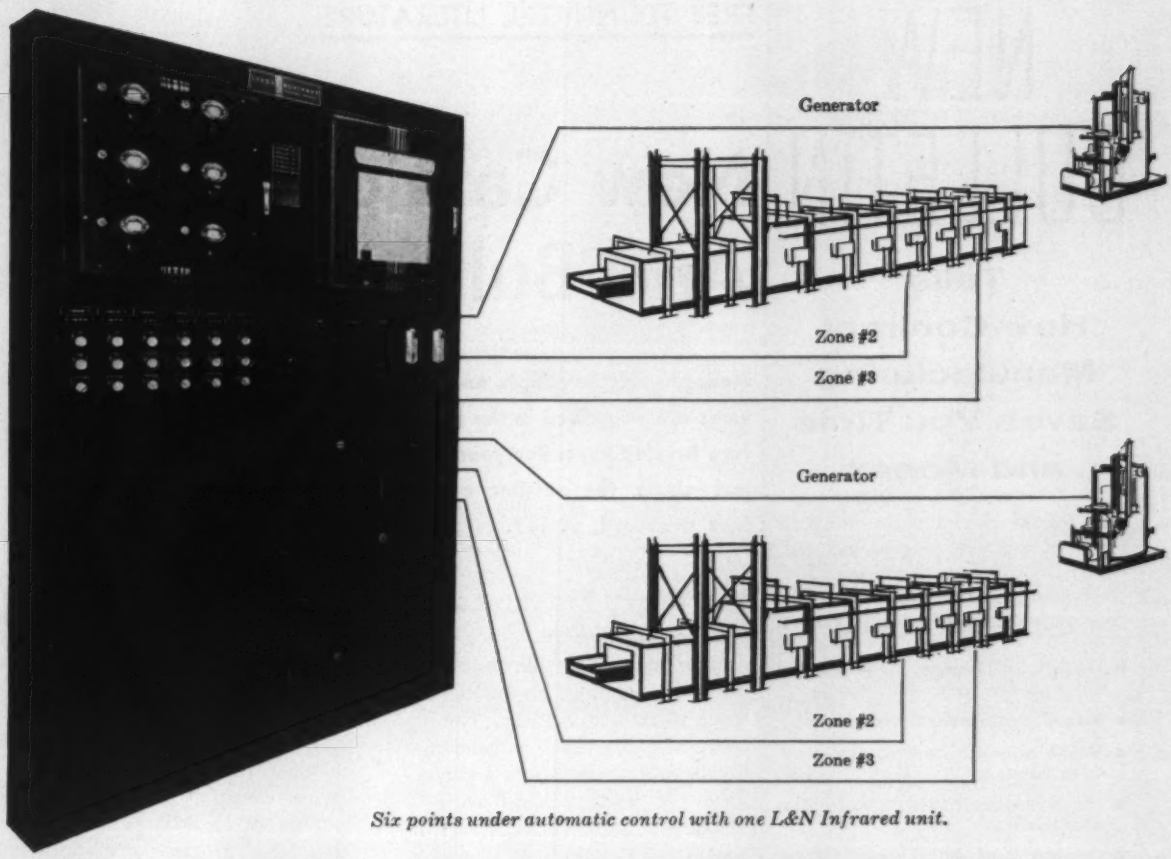
"Patent Review" now appears in The IRON AGE as a regular weekly feature.

Strong Magnet

Magnetic material, W. R. Hibbard, Jr., and J. L. Walter (assigned to General Electric Co., Schenectady), June 14, 1960. Process for rolling and heat-treating body-centered cubic iron base alloys. This forms polycrystalline sheet with a high degree of cube texture grain orientation. No. 2,940,882.

Die Alloy

Aluminum-bronze alloy containing manganese and chromium and having improved wear resistance, J. F. Klement (assigned to Ampco Metal, Inc., Milwaukee), May 24, 1960. An aluminum-bronze alloy, for deep-drawing dies, comprises about 15-pct Al, 4.25-pct Fe, 2-pct Mn, 1.5-pct Cr, and the remainder Cu. No. 2,937,941.



Six points under automatic control with one L&N Infrared unit.

New L&N Infrared Analyzer Package automatically holds furnace and generator atmospheres "in line"

The L&N IR Analyzer equipment for automatic control of heat treating atmospheres offers five outstanding advantages.

- *It is rugged, reliable and easy to operate.*
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- *Each unit may be calibrated for either CO, CO_2 or CH_4.*
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This new package of the time-proven L&N IR Analyzer, designed specifically for metallurgical use, is now automatically controlling atmospheres in a number of well known metalworking plants. It has earned the respect of management and operating personnel alike for its accuracy, dependability and ease of maintenance.

For more information request Folder N-91-620(1) from your nearest L&N office or write 4956 Stenton Ave., Phila. 44, Pa.

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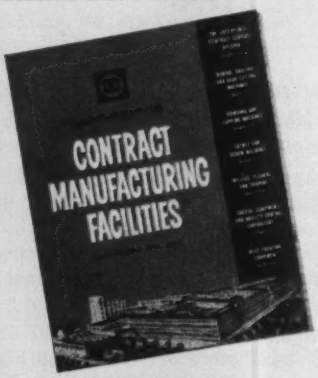

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 119.

Vibratory Machines

A comprehensive, three - color catalog describes, illustrates and provides technical information on seven vibratory machines. The brochure also illustrates and describes a wide variety of "before and after" views of parts finished with the machines and methods. (King-Seeley Corp.)

For free copy circle No. 1 on postcard, p. 119

Process Control

The subject matter of a 12-page booklet graphically outlines the company's approach to industrial-process control systems. Designed primarily for management and technical management, the booklet covers such subjects as the benefits of a total systems approach, and an explanation of the company's guarantee of 99-pct operational availability. (Daystrom, Inc.)

For free copy circle No. 2 on postcard, p. 119

Large Nuts

Describing a complete line of nuts milled from the bar, a brochure features compact, condensed tables. The tables are in an easy-to-order form that greatly simplifies the specification and purchasing of nuts for the heavy machinery and construction industries. Complete dimensions, thread specifications, keg quantities, weights and prices are all given in one compact, concise table for each type of nut. Types cataloged are finished and semi-finished hexagon heavy full, jam and slotted nuts. (The Acimet Mfg.. Co.)

For free copy circle No. 3 on postcard, p. 119

Electron Beam Welding

The subject of a 12-page catalog is electron beam welding. This method welds by the direct bombardment of metal with highly-accelerated electrons in a vacuum chamber. Illustrated throughout, the brochure covers all of the salient features of electron beam welding, how the process operates, the principal advantages, and the equipment required. (Air Reduction Sales Co.)

For free copy circle No. 4 on postcard, p. 119

Toolroom Equipment

A 4-page bulletin describes a number of products for the toolroom. The booklet includes illustrations of a hand tapping machine, die assembler, three toolroom vises, and other tools. (The Producto Machine Co.)

For free copy circle No. 5 on postcard, p. 119

Laboratory Recorder

Fully - illustrated, a four - page booklet describes a new high-sensitivity, high-speed, budget-priced recorder for general lab use. Simplicity is a feature of the new instrument. You set the electrical zero anywhere on the chart by turning a single knob. A lever and switch give a choice of ten chart speeds. (Fisher Scientific Co.)

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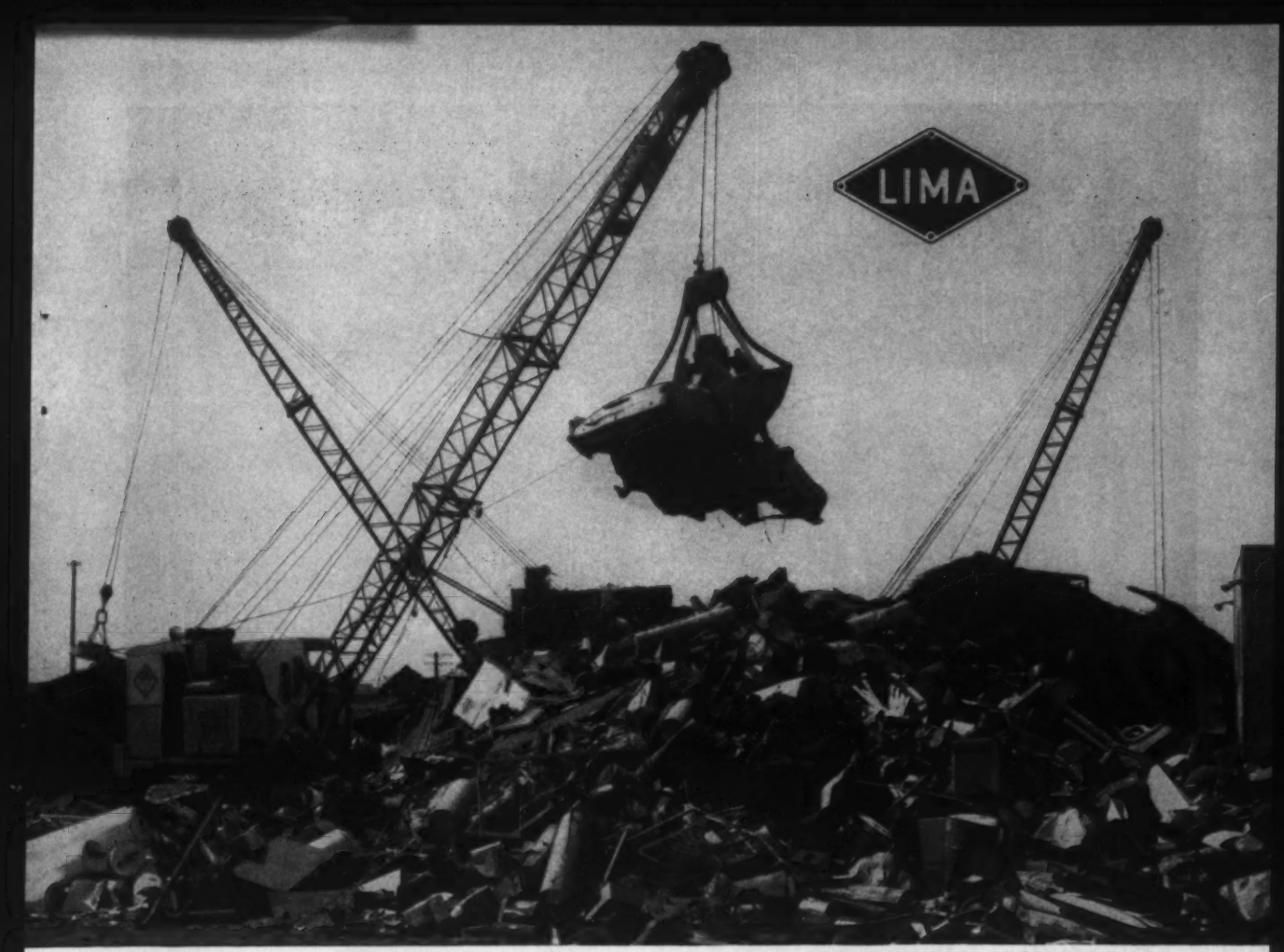

Buffalo salvage firm says:

DEPEND ON LIMAS WHEN MINUTES MEAN DOLLARS!

"At the peak of the scrap market, when minutes mean dollars, our three Lima 34's have shipped as many as 6000 tons of scrap in one month!" says Nick Redino, of R & R Salvage Corp., Buffalo, N. Y.

"Limas hold up well. They're dependable, economical machines to own and operate. Downtime is minimal. They work at full speed 80 hours or more each week, in all types of weather and under the most rugged operating conditions—in abrasive sand, dust, mud, slush and snow. In one 2½-month period the Limas salvaged 1500 tons of scrap from brick and mill scale.

"Front end interchangeability is an important Lima advantage. It's easy for us to make daily changes from bucket to magnet. We're sold on Limas!"

There's a Lima type and size for every job—cranes to 140 tons crawler mounted, 80 tons on rubber; shovels, ½ to 8 yd.; draglines variable. Learn how dependable Lima quality can add extra profit to your operations. Limas are available with gasoline, diesel or electric power; crawler, truck or wagon mounting. See your nearby Lima distributor today or write to Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

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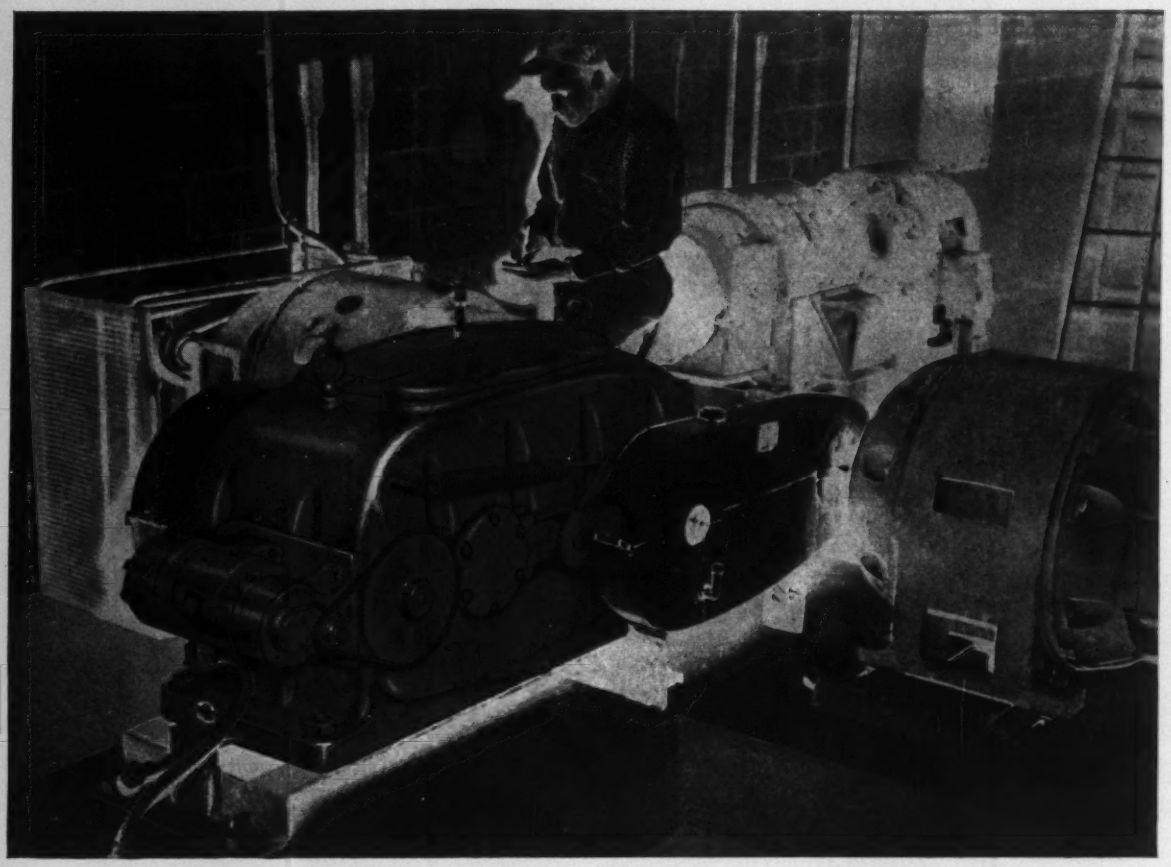
BALDWIN BLH LIMA-HAMILTON



For stepless, slipless, accurate, infinitely variable speed control:

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P.I.V. LINK-BELT VARIABLE SPEED DRIVES

UNIQUE in operation, unmatched in accuracy! That's Link-Belt P.I.V.—the *only* chain-driven variable speed drive. Teeth—not tension—permit instant ratio changes with no loss of efficiency, regardless of load conditions.

P.I.V.'s exclusive all-metal, self-tooth-forming chain consists of packs of free-sliding steel slats which serve as teeth. The chain meshes with radially grooved wheels cut to a constant depth toward the wheel periphery. Beveled sides of the grooves offer gripping areas . . . provide a positive, nonslip contact at any speed, under all loads.

Link-Belt P.I.V. drives are available in 8 sizes and 16 standard types, in capacities from ½ to 25 hp—horizontal or vertical housings. Type RS P.I.V. variable speed drive is available in capacities up to 50 hp.

Book 2274 contains the complete P.I.V. story. For your copy, contact your nearest Link-Belt district sales office or authorized stock-carrying distributor. Refer to the yellow pages of your phone directory under Power Transmission Equipment.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15.348

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Mesh-Belt Furnaces

Consisting of four pages, a bulletin describes features and advantages of ribbon or silicon carbide resistor, mesh-belt furnaces. They are used for copper brazing, silver brazing, sintering and bright annealing. Illustrated publication contains tables of furnace dimensions and typical production curves. (General Electric Co.)

For free copy circle No. 11 on postcard

Inhibitors

The application and installation of arc inhibitors are described in a two-page bulletin. Electrical characteristics as well as dimensions are also included. The arc inhibitors are primarily used on dc crane and mill controllers operated by master switches or pendent push buttons. (Square D Co.)

For free copy circle No. 12 on postcard

AC Motors

Dealing with ac multi-shielded motors, an illustrated 56-page catalog includes complete pricing and dimensional data on motors of this type. The motors range from ¼-200 hp. Information is included for various modifications. A special section deals with motor selection and application. (Sterling Electric Motors)

For free copy circle No. 13 on postcard

Electroplating Filters

Technical data on eight, standard side cleaning models of filters are offered in a descriptive brochure. High area low pressure, portable filters for the plating industry remove contamination from nickel, copper, cadmium and zinc plating solutions. The well-illustrated brochure also contains a specification table on all models. (Udylite Corp.)

For free copy circle No. 14 on postcard

Elevator Rope

When elevator rope should be retired, lubrication, safety factors, diagrams, and specifications are fully covered in an elevator wire-rope book. (Macwhyte Wire Rope Co.)

For free copy circle No. 15 on postcard

Socket Cap Screws

Complete specifications for socket cap screws are given in a bulletin. It includes tables giving dimensional standards, concentricity limits, and threading dimensions for the screws. (The Bristol Co.)

For free copy circle No. 16 on postcard

Waste Heat Boilers

A line of waste heat boilers is described in a bulletin. The bulletin contains engineering drawings and specifications on this specialized line of forced recirculation generators, designed to make maximum use of waste heat from industrial and process heat sources. (International Boiler Works Co.)

For free copy circle No. 17 on postcard

Hydraulic Components

A six-page bulletin describes components designed for hydraulic systems up to 5000 psi. General specifications as well as photographs of typical models are included. (Denison Engineering Div., American Brake Shoe Co.)

For free copy circle No. 18 on postcard

Ejector Punches

A four-page bulletin features a new pull-pin ejector punch. This punch permits rapid removal of the ejector pin for point sharpening. (The Producto Machine Co.)

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Mold-Release Oils

Mold-release oils, for zinc and aluminum die casting, are described in a new technical bulletin. The publication summarizes the die-casting conditions under which each

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FREE LITERATURE

of the three new oils should be used. It also briefly outlines the company's "chemical - additives" approach to mold lubrication. (Sun Oil Co.)

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Spraying Machine

A brochure describes an air-operated, automatic single - spindle rotary spraying machine. The machine has vertical traveling guns for finishing cylindrical and rectangular parts. (Conforming Matrix Corp.)

For free copy circle No. 21 on postcard

Inclinable Presses

Featuring a line of newly-designed open-back, inclinable presses, a catalog presents completely new specifications on all models. Complete technical information on a new friction-type air clutch, chain or gear-driven dial feeds and special presses is also included. (Federal Press Co.)

For free copy circle No. 22 on postcard

Iron and Steel Rolls

Containing complete product information, a catalog details all the aspects of the company's manufacturing, hardening, and heat-treating processes. The catalog includes sections on heat-transfer rolls, carburizing, design, special heat-treating facilities and dual metal chilled iron rolls. (The Badall Co., Inc.)

For free copy circle No. 23 on postcard

Centrifugal Fans

A 76-page booklet describes the complete line of fans with flat, backwardly-inclined blading. These fans are suited for a number of applications. The descriptions of key components and features of these fans are well illustrated, and the booklet consists mainly of tabular performance data and dimensions for AMCA Class 1, 2, and 3 fans. (Westinghouse Electric Corp.)

For free copy circle No. 24 on postcard

Mechanical Deburring

Four methods of mechanical deburring are detailed in a four-page folder. The literature describes and diagrams the methods, and gives numerous examples of their application. Illustrations and text show the various types of equipment available for the deburring processes to remove burrs or flash from machined parts, stampings, die castings, and powdered metal parts. (Wheelabrator Corp.)

For free copy circle No. 25 on postcard

Gears, Gear Boxes

A 32-page brochure gives information on custom gears and custom gear boxes. In addition, illustrated information on facilities for precision manufacture and inspection of made-to-order gearing is included. The brochure also contains many pages of technical material useful to engineers and production management. (For free copy write on company letterhead to The Cincinnati Gear Co., Wooster Pike and Mariemont Ave., Cincinnati 27.)

Rhodium Plating

Plastic laminated, an instruction sheet deals with the use of rhodium-plating solutions. Designed for mounting on or near the rhodium plating tank for quick reference, the sheet gives instructions on making baths for decorative and industrial rhodium finishes; and also on preparing surfaces for plating. The sheet also includes general suggestions on good rhodium-plating procedure. (Texas Instruments Inc., Metals & Controls Div.)

For free copy circle No. 26 on postcard

CO_2 Foundry Process

The carbon-dioxide foundry process, for producing castings to critical tolerances quickly and economically, is described and illustrated in a booklet. The CO_2 process, the chemical reaction, selection of sands for use with the process, and sand reclamation are explained and discussed. The use of carbon dioxide is described and illustrated in a as warm air or nitrogen in setting up sodium silicate bonded sands. (Cardox Div., Chemetron Corp.)

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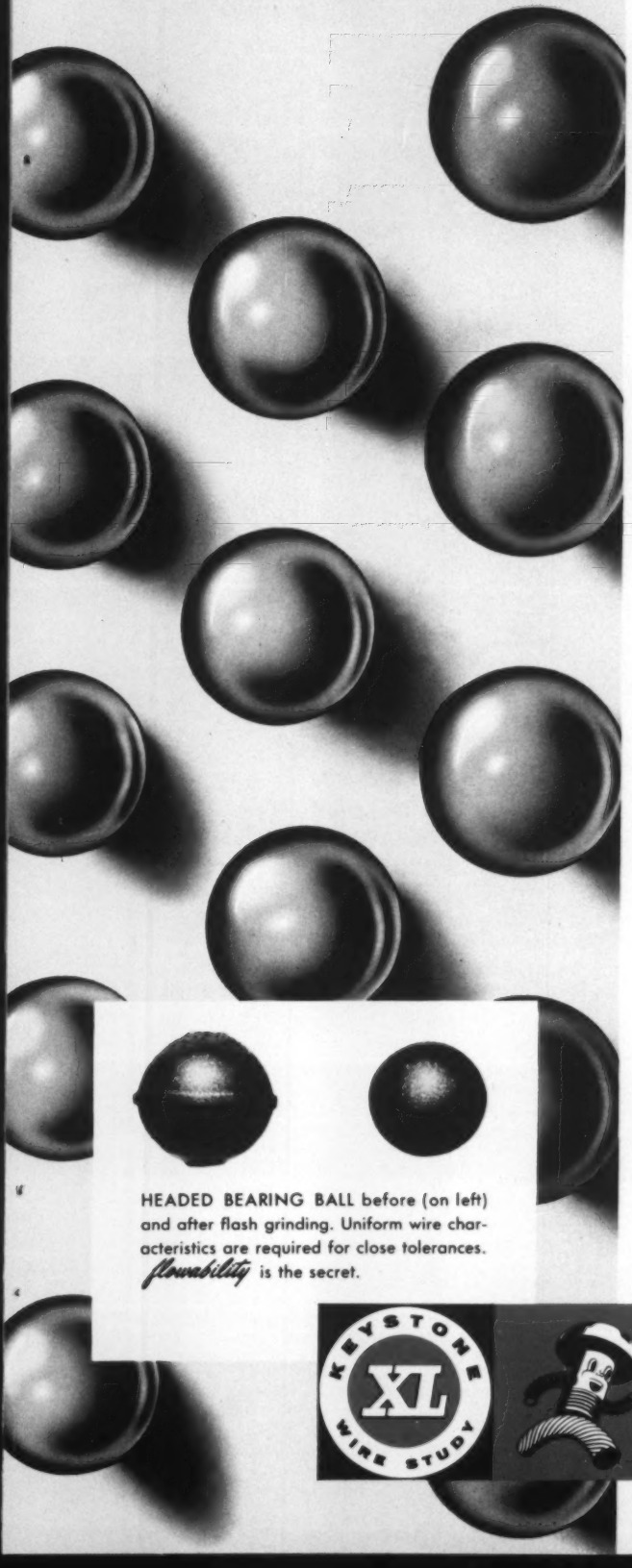
PIONEER

STEEL BALL COMPANY, INC.

MILL STREET, UNIONVILLE, CONNECTICUT, U.S.A.



HEADED BEARING BALL before (on left) and after flash grinding. Uniform wire characteristics are required for close tolerances. *flowability* is the secret.

KEYSTONE WIRE

rewards ball manufacturer

Rolling from the heading dies of Pioneer Steel Ball Company, Inc. of Unionville, Connecticut, come steel bearing balls made from wire for uses ranging from missiles to roller skates, to bag fasteners, to balls for burnishing.

Pioneer bearing balls must conform to approved engineering standards with sphericity often specified as close as .00001". To get maximum quality, Pioneer makes a point of knowing their basic material—wire!

President N. Martinelli says, "This combination of right chemical analysis with special drawing and thermal treatment results in proper end quality. You can't have one without the other. That's why we like Keystone "XL" Ball Bearing Wire. It has consistent *flowability* and hardenability properties."

Keystone "XL" Ball Quality Wire conforms repeatedly to analysis of interior hardening properties and exterior workability for upset actions. Care in drawing the wire assures consistent characteristics—uniform size, extremely fine grain structure, *flowability* that results in long die life and high quality bearing balls.

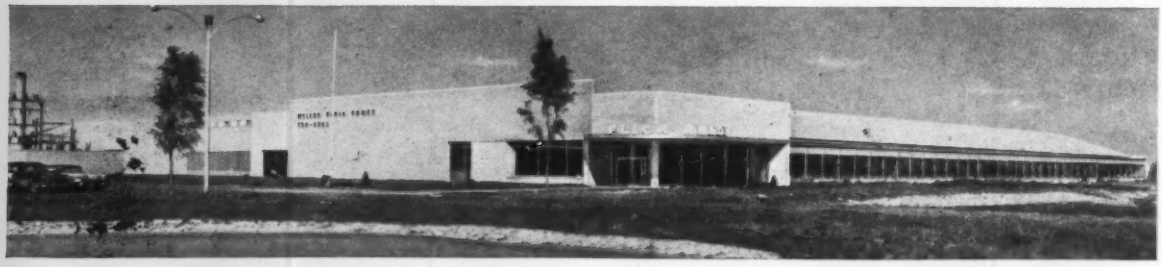
Perhaps your wire problem can be solved the Keystone way. Phone or write today for consultation with a Keystone representative regarding application of "XL" Heading Wire to your product.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE

WIRE FOR INDUSTRY

The deck is cleared for action . . .



In this production-designed Butler building

Up out of the way are heating and ventilating fixtures, lights, bus ducts and cranes. All floor space is reserved for employees, their machines and materials handling equipment. This is a plant geared for production.

This is a Butler building—all 222,000 square feet of it. It belongs to Flick-Reedy Corp., Chicago, whose Miller Fluid Power division manufactures air and hydraulic cylinders. Frank Flick, president, says the working conditions in this building promote employee comfort, safety and convenience. This spells high morale, a key factor in quality production.

Flat roof structures have no such natural accommodation for fixtures, which swoop low overhead, or occupy important floor space. Butler industrial buildings, such as Flick-Reedy's, have the muscle to support heavy cranes and hoists. No need to resort to obtrusive floor cranes, or shore up overhead craneways with bulky, costly reinforcements.

You won't find heavy, expensive interior partitions in Flick-Reedy's production area. Powerful Butler rigid frames support the roof, and span wide, column-free areas. Interior supporting walls are superfluous. This is more than a major economy. It provides a spaciousness that employees like, an openness that means safety, convenience, efficiency.

There's more. Butler offers two new superior curtain wall panels: Butlerib, a handsome, precision formed panel of great strength, and Monopanl, an exclusive factory-insulated panel—both in factory-applied colors. You'll like them. Consult your Butler Builder (in the Yellow Pages), or write direct.

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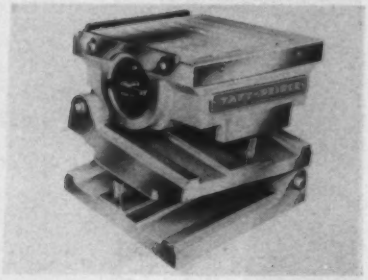
New Materials and Components

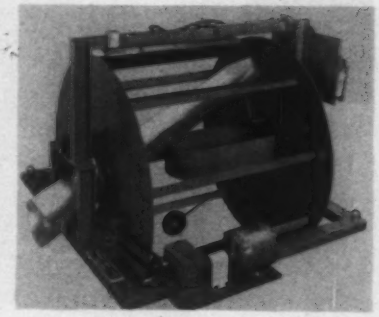
Magnetic Chucks Easily Set Jobs to Angles



Sine angle magnetic chucks provide trouble-free means for setting light machining or inspection jobs, to either simple or compound angles. A control knob on either side will quickly energize the magnetic surface, lightly, for easy positioning of the work, or for maximum grip. Lock screws lock the plates at any angle. Angle settings are obtained by use of gage blocks. A precision-ground step on the base plate makes it possible to set angles down to zero. The chucks feature a powerful rotary pack which is permanently magnetized. (Taft - Pierce Mfg. Co.)

For more data circle No. 28 on postcard, p. 119

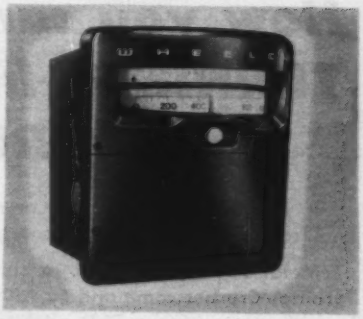
Rotary Filter Provides Large Filtering Capacity



Made up of eight simplified, screw-mounted screens on a rotating drum, an industrial filter occupies little floor space in proportion to its large filtering capacity. The contaminated fluid is carried by gravity down the entrance chute and into the turning filter drum. As the filtered fluid drains to the tank below, the sludge-coated screen rotates, constantly moving a clean filtering area into position. Reciprocating air nozzles "air-peel" the caked contaminant from the screen into the exit chute. There is no filtering media to throw away, and no operator is required. (Murray-Way Corp.)

For more data circle No. 29 on postcard, p. 119

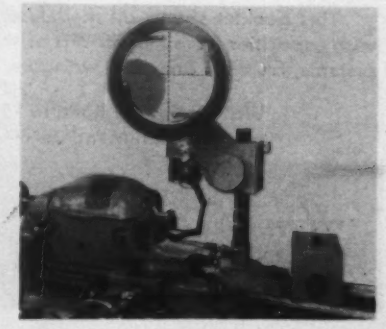
Measuring System and Power Supply—One Unit



A pressure indicator incorporates a measuring system and dc power supply in a single integral unit. A zener diode circuit regulates the voltage. The zero and span adjustment can be conveniently adjusted from the power chassis of the instrument. The plug-in type measuring system of the instrument is essentially a d'Arsonval movement, compensated for ambient temperature conditions. A linear scale is used. The full scale span in millivolts is between 4.9 and 5.5. Plug-in type control chassis may be used as part of this device, where pressure control is required, making it an indicating pressure controller. (Barber-Colman Co.)

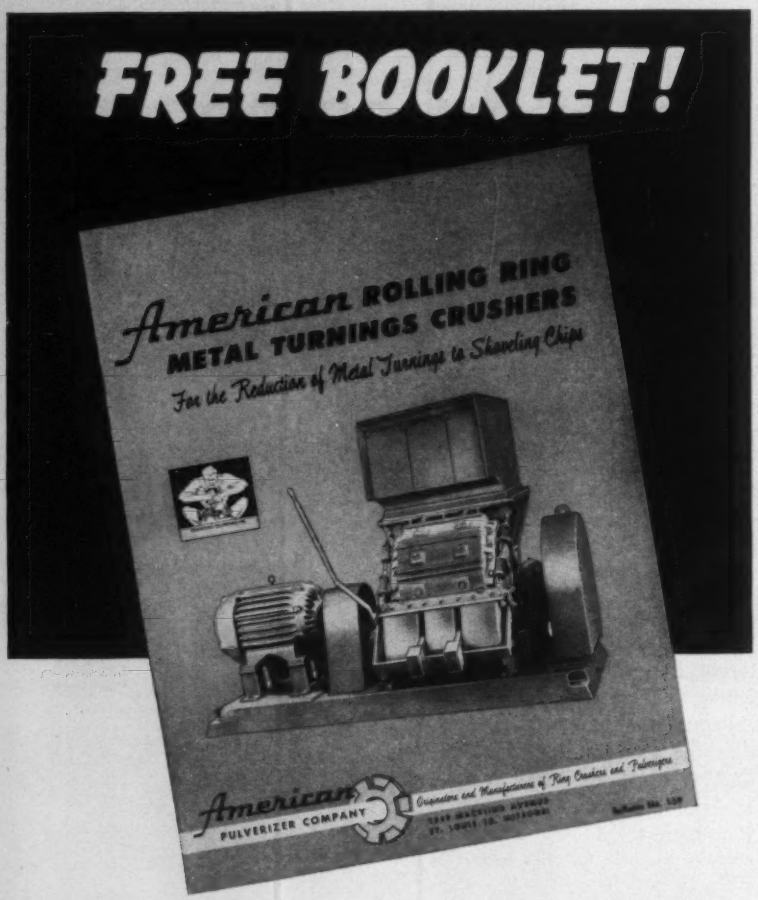
For more data circle No. 30 on postcard, p. 119

Optical Projector Increases Production Efficiency



Attaching to any lathe, an optical projector allows continuous and precise magnification for checking, direct measurement, and comparison of work in process to transparent overlay charts. The operator sees the work in magnified form on the screen at the same time the work is being done. With dimensions magnified, close tolerance work is tremendously simplified. With the layout on the screen, the operator can work to a line or specific dimension instead of a tolerance. The optical system gives a clear, sharp, high-contrast image. A selection of magnifications from 10x to 100x are standard and interchangeable. (Stocker & Yale, Inc.)

For more data circle No. 31 on postcard, p. 119



How you can turn METAL TURNINGS into additional PROFIT

If your plant has 20 tons or more metal turnings per month, this booklet will tell you how you can make a substantial yearly profit.

Metal turnings reduced to shoveling chips in an American Metal Turnings Crusher command $2 to $4 more per ton on the scrap market. In addition, you save 75% of storage space and recover 30-50 gallons more cutting oil per ton of turnings.

This booklet shows all models of American Metal Turnings Crushers with capacities from 2 to 50 TPH as well as installations showing conveyor systems, crushers and chip wringers.

Write today for Bulletin 159. It will pay you to have an American Metal Turnings Crusher in your plant.

American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1439 MACKLIND AVE. ST. LOUIS 10, MO.

DESIGN DIGEST

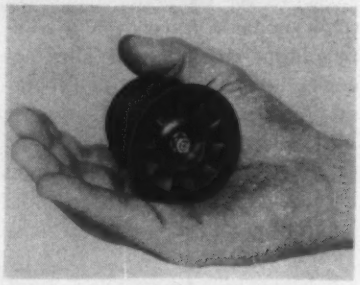
Control Knobs

A complete line of quality instrument control knobs is designed to MS-91528 specifications for military applications. The knobs come in six types, including rounds, skirted rounds, dial-skirted rounds, plain and skirted pointers, and crank-types. Knobs are molded of black Tenite No. 2. (Lerco Electronics, Inc.)

For more data circle No. 32 on postcard, p. 119

Blowers

Two-in. diam blowers employ motor speeds up to 22,000 rpm. Outstanding in the series is a blower which has a "no-stall" characteristic performance curve with a shutoff pressure of 6 in. H_2O and a free-air delivery of 32 cfm. This per-

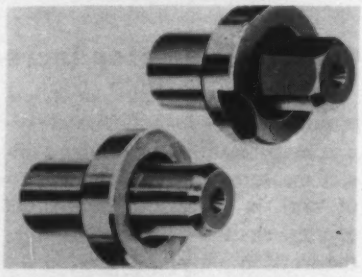


formance is obtained at a relatively low decibel rating. Various mounting features are also available. This series comes in different models with 400-cycle ac, 3 phase, 400-cycle ac, single phase, and 28-v dc motors. (The Benson Mfg. Co.)

For more data circle No. 33 on postcard, p. 119

Locating Pins

A line of locating pins comes in two styles in a full range of sizes. The pins, manufactured in both



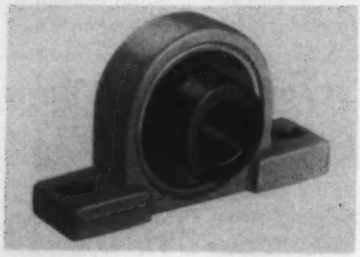
diamond and round styles, are designed with a resting shoulder feature that permits the pins to

serve as rest pads. The sizes range from ⅛- to 1½-in. head diameters. Both diamond and round shaped styles are carburized, hardened to Rockwell 60-62 for tough wearing surface with core left mild. The pins are used in bushing applications; also press fitted with lock screw holder. (Jergens Tool Specialty Co.)

For more data circle No. 34 on postcard, p. 119

Pillow Block Bearings

A compact line of pillow block bearings utilizes housings of ductile material. The bearings are designed for light and medium-duty service. Improved retention of lubricant and exclusion of dirt results from the adoption of an improved lip-

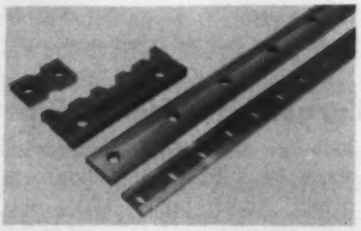


type seal. Constructed of a rubber impregnated fabric between metal shields, the seals efficiently maintain positive contact with the inner bearing ring at all times, regardless of shaft misalignment. (Hoover Ball & Bearing Co.)

For more data circle No. 35 on postcard, p. 119

Shear Blades

Solid steel and laid shear blades meet specific production requirements to insure low cost, accurate and continuous performance in every shearing application. Eight grades of steels are used according



to particular job application. These special steels, combined with rigid quality controls, mean greater tonnage sheared between grinds, lower tooling costs, and fewer rejects. (Simonds Worden White Co.)

For more data circle No. 36 on postcard, p. 119

DON'T WASTE MONEY ON "DO-IT-YOURSELF" CABLE ASSEMBLIES!

Buy 'em better—for less—from Macwhyte!

- Precision-made to the exact length, strength, and flexibility required for your equipment
- "Safe-Lock" swaged fittings develop the full strength of the wire rope
- Assemblies are absolutely uniform — right every time
- Can be given your parts number for easy reordering and resale
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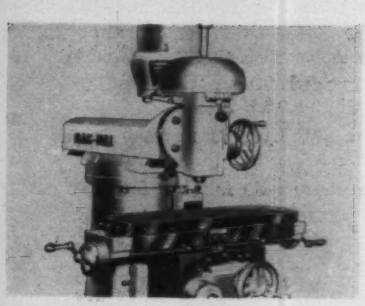
- You know the complete cost — there are no cost variables as when assemblies are hand-made in a non-specialized shop

SAVE TIME—SAVE MONEY

Here's a handy and helpful guide for selecting, designing and ordering factory made cable assemblies. Send for your copy of catalog No. 5601, to Macwhyte Wire Rope Company, 2900 14th Ave., Kenosha, Wis., U.S.A.

MACWHYTE Wire Rope COMPANY

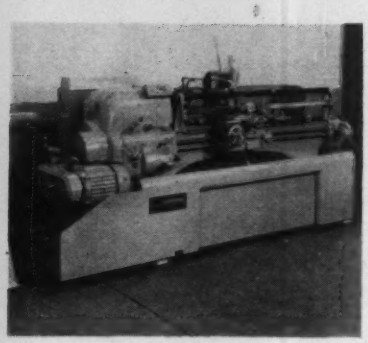
New Equipment and Machinery



Milling Machine Features Magnetic Table

Bolting and clamping the work-piece is eliminated on a vertical milling machine. The machine has a built-in magnetic table. A dc rectifier controls the electro-magnetic table. The rectifier contains a manual reversing switch which demagnetizes the table, work-piece and accumulated chips. The table has a 7- x 27-in. working surface and has three "T"-slots 11/16-in. wide and 2⅛ in. apart. Longitudinal table travel is 16 in., cross travel 8 in. Spindle construction insures maximum rigidity. (Hanchett Magna-Lock Corp.)

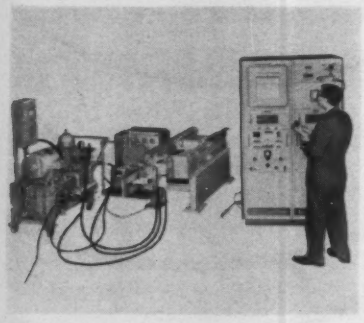
For more data circle No. 37 on postcard, p. 119



Turning Machine Turns Variety of Tapers and Turns

Without the necessity of headstock or tailstock centers, a machine tool produces a large variety of tapers, turns or radii on long slim work. The need for a tailstock center is eliminated through the use of a rotating spring collet, which acts as a work support 0.015 in. ahead of the tool point. The spring collet can handle stock varying ±0.002 in. from standard. Capacity for rounds, squares, hexagons or shapes is from ⅜ to 1¾ in. diam. The machine is a rigid bed on which a hollow headstock is mounted. All actuations of the tool are mechanical; no air or hydraulic devices are used. (Taber Instrument Corp.)

For more data circle No. 38 on postcard, p. 119



Machine Simulates Dynamic or Steady-State Force

A materials-test machine provides advanced cycling or fatigue testing of specimens or structures under compression-tension and elevated temperature conditions. It is capable of cycling up to 20 cps, and of following a typical programmed heating rate of 200°F per second. The machine has individual closed-loop systems for force and heat loading. It employs a high-speed ram that delivers up to an 8-in. stroke at a velocity of 1 ips at rated load. The standard force-loading channel has multiple ranges from 200-50,000 lb full scale; the temperature-loading channel has a range of up to 3000°F. (Compu-Dyne Corp.)

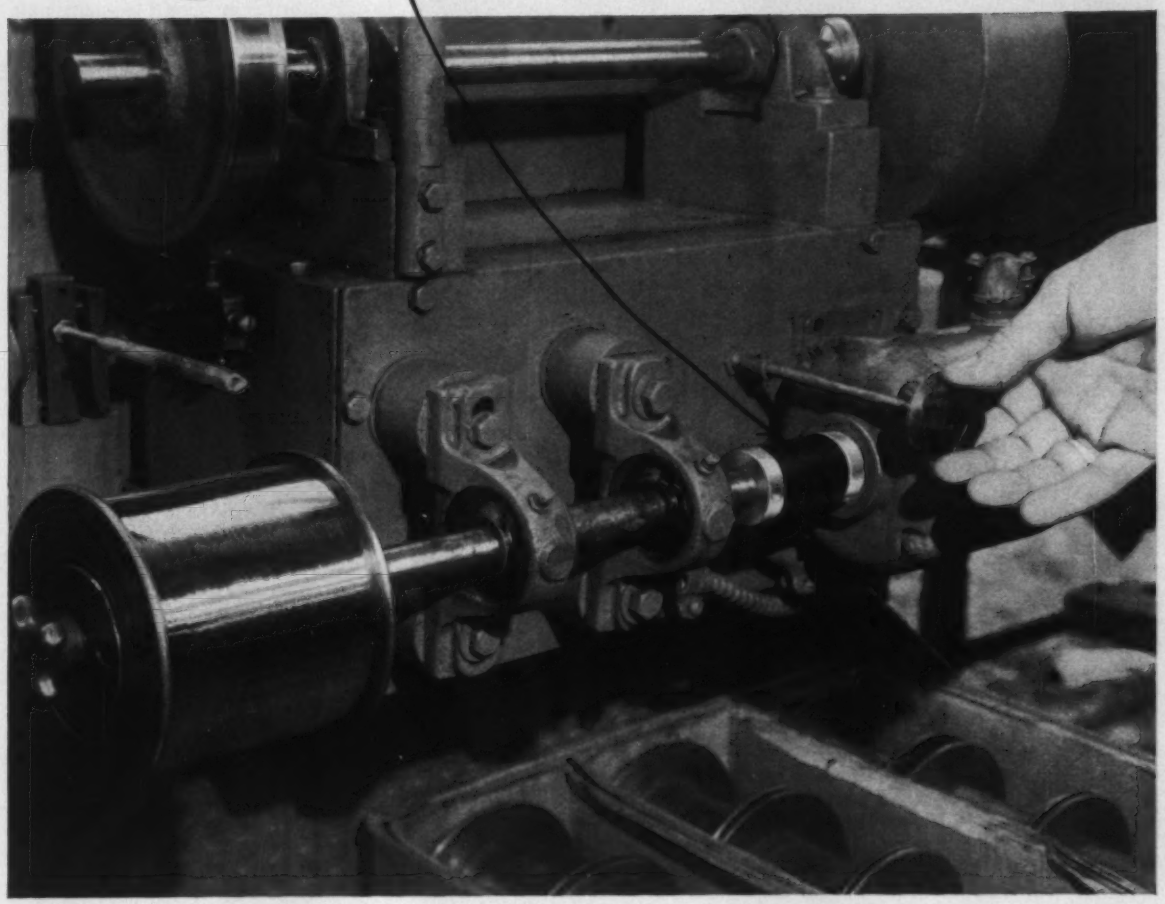
For more data circle No. 39 on postcard, p. 119

Bending Machine Handles Large, Extra-Heavy Pipe

Designed to meet heavy bending requirements, a rotary bending machine serves industries that form large pipe, tube, channel, angle and solid bar. The machine features smooth hydraulic operation, economy, and versatility of tooling, fast change-over in setup, convenient work height, and dependable bend accuracy within ±½°. It is self-contained and occupies a space of about 14 x 32 ft, including arm swing. Angles up to 180°, plus sufficient over-bend to compensate for springback, are formed in a single cycle. The machine can handle bends up to a 42-in. maximum centerline radius. (Pines Engineering Co., Inc.)

For more data circle No. 40 on postcard, p. 119

FLEXIBLE COUPLINGS



Compensating for misalignment in Viking Wire Co., Inc.

Wire drawing subjects machines to considerable shock loads. The Viking Wire Co., Inc. has a battery of 26 machines in the drawing room. This is one of the newest plants in the industry and has the latest in machinery, equipment and methods.

"U.S." Flexible Couplings were selected for all the machines (see picture) principally to absorb shock loads and compensate for misalignment. Other reasons for selection were ease of installation, lack of maintenance or lubrication and just plain overall efficiency.

These couplings are so simple in design that the cost is very low compared with other couplings. Insist on having these tried on your machinery—and then watch your costs go down.

One sure way to get expert transmission engineering is through your U. S. Rubber Transmission Distributor.

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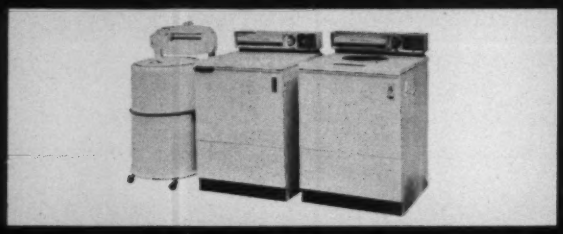
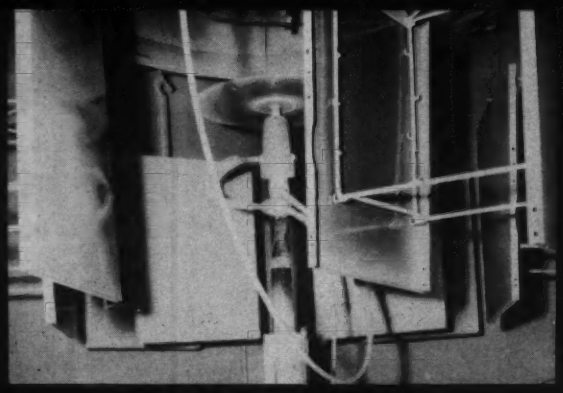


Get their High Quality Finish with



RANSBURG NO. 2 PROCESS

Kelvinator Division of American Motors switched from hand spray to RANSBURG No. 2 PROCESS Electro-Spray to meet increased production schedules . . . improve the quality of the finish . . . and lower finishing costs.

SAVINGS EXCEEDED EXPECTATIONS

Demonstration tests in the Ransburg labs indicated substantial savings in finishing costs, but in actual production, SAVINGS ARE EVEN GREATER than estimated. That's why Kelvinator is now considering RANSBURG Electrostatic Spray Painting for other products of their "white goods" line: Refrigerators . . . Home Freezers . . . Ice Cream Cabinets . . . Electric Ranges, as well as some components.

NO REASON WHY YOU CAN'T DO IT, TOO!

Want to know how Ransburg No. 2 Process can improve the quality of YOUR painted products, and at the same time, cut YOUR paint and labor costs? Write for our No. 2 Process brochure. Or, if your production doesn't justify automatic painting, let us tell you about the new No. 2 Process Electrostatic Hand Gun which can be used in either conveyorized, or non-conveyorized painting.

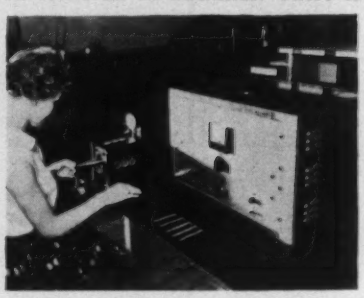
RANSBURG

RANSBURG
Electro-Coating Corp.
Box-23122, Indianapolis 23, Indiana

NEW EQUIPMENT

Ultrasonic Welder

Featuring increased capacity and a self-tuning circuit, an ultrasonic spot welder joins similar or dissimilar metals, of equal or different thickness. The top piece may be up to 0.006 in. in thickness. There is

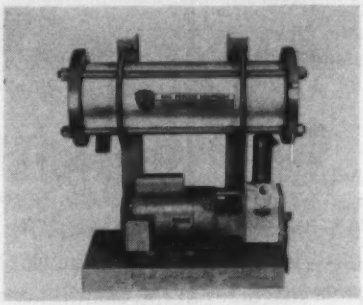


no limit on thickness of the bottom piece. Materials as thin as 0.00025 in. have been joined. The ultrasonic process produces negligible heat and requires only light clamping pressure (International Ultrasonics, Inc.)

For more data circle No. 41 on postcard, p. 119

Heat Exchangers

Complete with recirculating pump, heat-exchanger units are designed for heating or cooling acids or other liquids, in tanks having capacities up to 900 gal. The



combination package heat exchanger and pumping unit is very compact, measuring about 28-in. long, 10-in. wide and 20-in. high. (Heil Process Equipment Corp.)

For more data circle No. 42 on postcard, p. 119

Safety Shoes

Light plastic of unusual strength forms the protective core of a flap that covers the instep of steel-toed safety shoes. The shoe laces above the ankle with a built-in steel toe. In addition, it features a snug-fitting

flap, covering the arch, but light enough to be extremely flexible and strong enough to withstand 25 ft-lb without injury to the foot. (International Shoe Co.)

For more data circle No. 43 on postcard, p. 119

Lubricant Stick

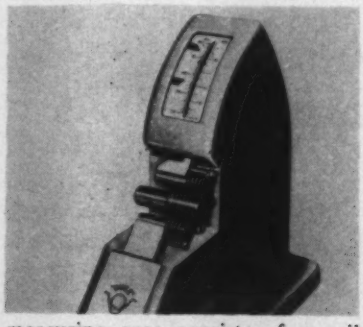
Extreme - pressure molybdenum disulfide dry lubricant is resin bonded for greater strength. In the form of a stick, it permits easy application of a lubricating film to cutting and shaping tools, sliding areas of small and medium size machine

parts; or wherever metallic dry friction occurs on sliding surfaces. Application is simple. The stick is just rubbed firmly over the cleaned surface. (The Alpha-Molykote Corp.)

For more data circle No. 44 on postcard, p. 119

Checks Pitch Diameter

Together with any standard hand micrometer, a screw thread comparator enables the user to determine the actual size of a screw thread; and whether it is within tolerance. Reference to table or calculations is not necessary. The



measuring gage consists of a coil spring mounted on a data plate. Inserting the gage on the thread is done by depressing the lever thus expanding the coil. Measurements are taken with an ordinary micrometer over the coils and then

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IRON BAR STOCK

for high quality, long wearing parts at low cost

Here are reasons why you will want to learn more about Shenango solid bars and centrifugally cast tubular bars for quality parts produced on your automatic screw machines or lathes:

- Available centerless ground or as cast
- Lengths up to 6', 1" to 14" diameter
- Choice of analyses—GC Meehanite, GA Meehanite, Ductile Iron, Ni-Resist, Ductile Ni-Resist
- Eliminates pattern equipment costs
- Increases production output
- Small quantity ordering reduces inventory
- Fast delivery to exacting specifications
- Machines with a free-cutting chip, not a fine powder
- Special solid bar shapes available... hexagonal, square, rectangular and oval

Write on your letterhead for a machining sample. Centrifugally Cast Products Division, The Shenango Furnace Company, Dover, Ohio.

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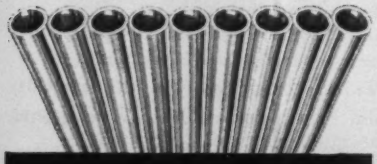
COPPER, TIN, LEAD, ZINC BRONZES • MANGANESE AND ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE METAL • ALLOY IRONS • DUCTILE IRON

■ It crisscrosses the nation. It has the ear of pioneering people in almost every important metalworking capital of our economy. It accepts the new cold-drawing assignments with confidence and traces its tubular performance from the outer reaches of space to the very wake of the atomic sub fleet itself.

■ When YOU call TMI you will be speaking to an exclusive group of dedicated people who have dared their way into the kind of tubing experience that paced much of America's mechanical progress for the past 20 years. And that will continue to do more of the same for a world of tomorrows!



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The Mark of Quality TMI

Stainless and special alloys .050" to 1.250" O.D. drawn as close as .0005"

NEW EQUIPMENT

checked with limits printed on data plate. (Scherr-Tumico).

For more data circle No. 45 on postcard, p. 119

Portable Nibbler

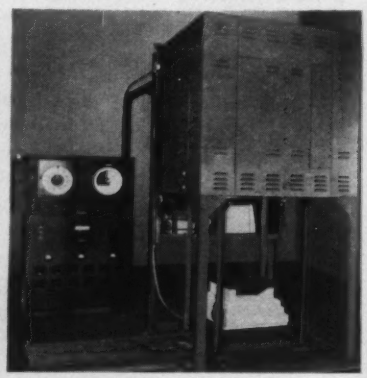
A portable nibbler proves to be a lightweight hand tool that can be carried from job to job. This permits corrugated sheets of metal to be more accurately measured, cut and fitted at its installation. Even tough pitch or asbestos coated cor-

rugated steel is cut—without clogging or slowing down the cutting action. Due to its special punch and die action, metal chips are forced downward, away from the operator. (Fenway Machine Co.)

For more data circle No. 46 on postcard, p. 119

Electric Furnace

A non-metallic resistor electric furnace gives ±2° accuracy up to 2700°F. Firing is rapidly accomplished into the 2000-2700°F range. Cooling can be quickly accomplished by an external sealed heat ex-



changer to follow a program controller. Elevator operation can be either mechanical or hydraulic. This type of atmosphere furnace is adaptable to many uses, such as crystal growing and firing of ferrites, titanates and similar electronic ceramic parts. (Harrop Precision Furnace Co.)

For more data circle No. 47 on postcard, p. 119

Vegetable Gum

In dry powdered form, a vegetable gum is derived from okra. Added in small quantities to the electroplating bath, okra gum is particularly effective in providing a brightening action on nickel plate. It may also be used in plating silver, copper and cadmium. Brigh-

ADVANCE CANTON FLANNEL HOTMILL GLOVES

THE FINEST HOTMILL GLOVE ON THE MARKET

Extra large. Zigzag quilting will never ravel out. "Cushion Palm" offers more protection—better wear.

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ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

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tening is sometimes increased to the extent that no further buffing or polishing is needed. (Morningstar-Paisley, Inc.)

For more data circle No. 48 on postcard, p. 119

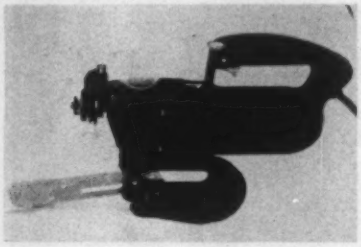
Refractory Cement

New and improved formulations of refractory cements are available in heat-setting and air-setting types. They are used for bonding mullite, high alumina, kaolin, super-duty or fireclay brick and shapes in any high-temperature furnace. Properties of the new formulations include materially-improved workability in either dipping or trowelling consistency; excellent refractoriness with high bonding strength; superior resistance to slagging or erosion; and negligible shrinkage at high temperatures. (Chas. Taylor Sons Co.)

For more data circle No. 49 on postcard, p. 119

Portable Press

Any size or shape hole can be punched out at assembly with a portable punch press. This 15-lb portable electric punch press was designed to punch out round, square, rectangular or any shape



hole by merely changing punch and die. This takes only a matter of minutes. The press can be used on stainless steel, brass, plastic and all other materials up to ⅛-in. capacity. (Modern Mfg. Co., Inc.)

For more data circle No. 50 on postcard, p. 119

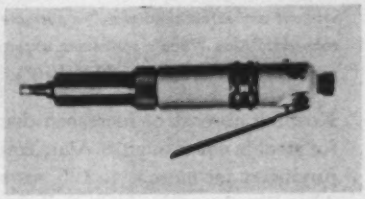
Aluminum Coating

A coating can be applied directly to uncleaned and untreated aluminum. Available in clear and a wide range of colors, it is particularly suitable for use on foil packaging, gift wrapping and containers. The coating is a high-gloss baking synthetic with exceptional adhesive properties. It forms a tough, abrasion-resistant film which will not scratch, rub off or crack. (Cosden Paint Co.)

For more data circle No. 51 on postcard, p. 119

Air Power Tool

Completely automatic, a torque limiter assures absolute torque accuracy. With pre-set fastener control, the torque limiter is fool-proof, releasing instantly when the predetermined torque is reached. It has a torque range from 2 in.-lb to 85 in.-lb. The unit is interchangeable with both lever and pistol grip models. Predetermined torque control prevents damage to screws, nuts



or work, and eliminates the need for hand torque wrenches. (Master Power Corp.)

For more data circle No. 52 on postcard, p. 119

NEW

BALANCED WAVE TIG WELDER DELIVERS DEEP, CLEAN "X-RAY" WELDS ON SHEET METAL or PLATE

miller

• A bold new concept in electrical design and circuitry is introduced in the all-new Miller BWC-300MAP. One of several notable results is complete and automatic elimination of the d-c component at all welding currents . . . an essential in certain critical welding applications.

• Due to the specially designed transformer, high arc initiation voltage and unique circuit, arc-outages cannot occur.

• "Fail-safe" voltage reducer automatically lowers the high arc initiation voltage to a low open circuit voltage — even in case of malfunction of the reducer.

• Five independent welding ranges with overlap offer an infinite number of positive, fine current settings — another characteristic of Miller's electrical control that speeds up and simplifies critical welding jobs.

EXCLUSIVES! — found only in new Miller BWC-300MAP:

1. Perfect balance throughout the entire welding range EVEN DURING CRATER ELIMINATION.
2. Arc stability WITHOUT HIGH FREQUENCY at as low as 18 amperes.

The outstanding versatility of this welder, and the specifics on its various features, are detailed fully on our form #BW-3 — a copy of which will be sent to you promptly upon request.

miller ELECTRIC MANUFACTURING COMPANY, INC. • APPLETON, WISCONSIN

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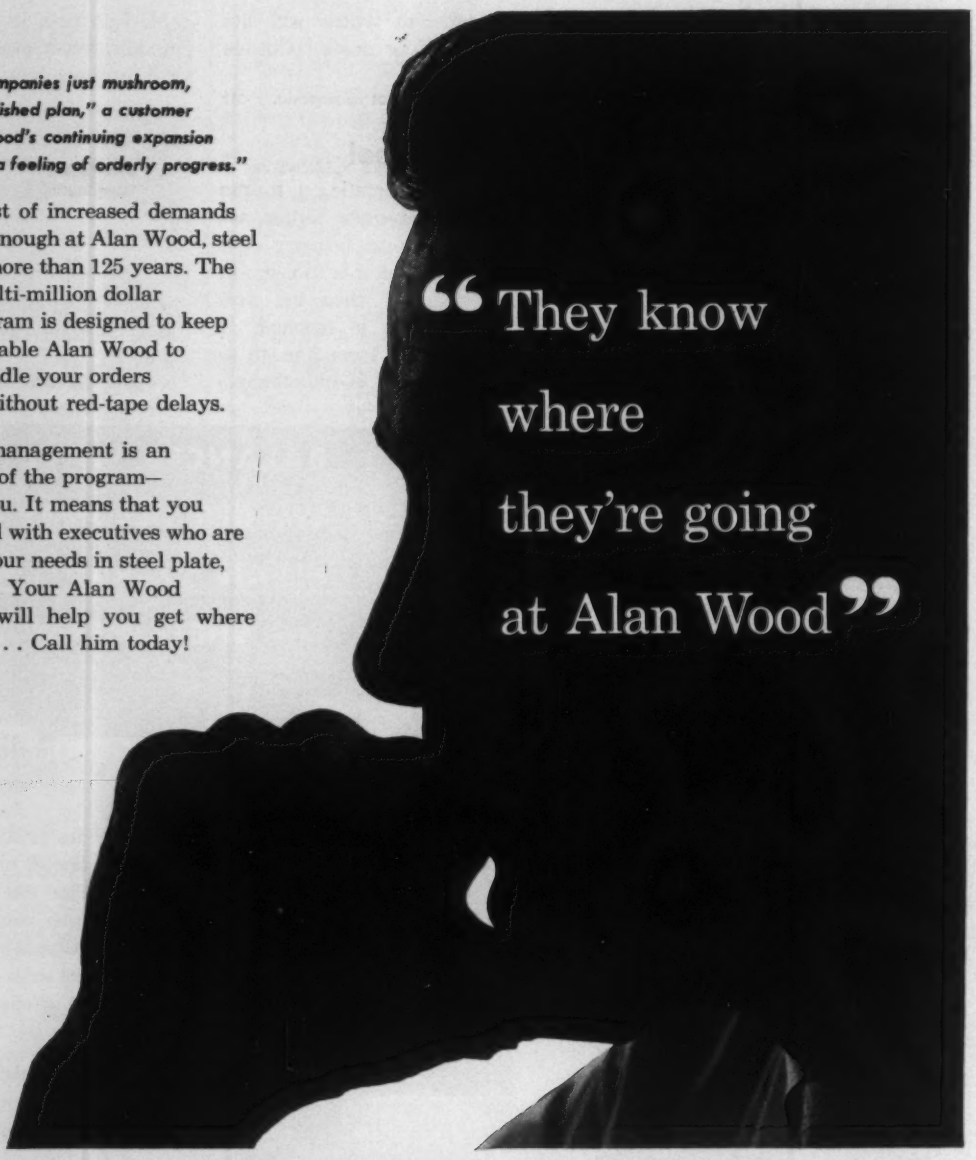
"A good many companies just mushroom, without any established plan," a customer remarks. "Alan Wood's continuing expansion program gives us a feeling of orderly progress."

Keeping abreast of increased demands for steel is not enough at Alan Wood, steel producers for more than 125 years. The Alan Wood multi-million dollar expansion program is designed to keep *ahead* . . . to enable Alan Wood to continue to handle your orders immediately, without red-tape delays.

Continuity of management is an important part of the program—important to you. It means that you continue to deal with executives who are familiar with your needs in steel plate, strip and sheet. Your Alan Wood representative will help you get where *you* are going . . . Call him today!



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The Iron Age Summary

Auto Setbacks Delay Recovery

Major automakers have set back some orders of steel from August to September.

While actual market effect may not be great, the changes come at the low ebb of the market and add more gloom to the market.

■ Delays in shipments requested by automakers have hit the expected recovery of steel operations.

Two of the three major auto companies have set back some August tonnage into September. This means that introductions of 1961 models have been delayed or initial production rates have been cut back.

Where It Hurts — Because the automotive steel market has been the only strong point, the setbacks in tonnage for August are causing more than usual concern. In addition, they come at the bottom of the seasonal ebb and add more gloom to the market picture.

The immediate recovery from the July 4 bottom in steel operations will be less than expected. And operations in the 50's (as a per cent of capacity) are expected to continue into August.

Slow Ordering—The rate of incoming orders at the mills is now running no better than 45 to 50 pct of a capacity rate. Orders for many products are much lower than 40 pct because of the relatively high level of flat-rolled business.

For example, one mill with an order rate of 50 pct of capacity reports its sheet bookings are 70 pct. This illustrates how bad the books look on products other than flat-rolled.

Some Hopeful Signs—There are a few scattered signs of improvement. Wire orders at one mill are exceeding forecasts. Pickups are reported for tubing specialties and standard pipe.

Inventories are now down to the point where new orders for steel reflect the state of business of consuming industries. This will result in some general improvement as seasonal effects subside.

Fast Delivery — Another factor contributing to the delay in recovery is the prompt delivery of steel from the mill. Because most mills are carrying in-process stocks or even stocks of finished products and can promise quick delivery, steel users are in no hurry to place orders.

This even extends to steel warehouses, which are now engaged in cutting their own stocks to the low limit. Service center business itself is slow and the price situation there is best described as chaotic.

Inventory Outlook—With inventories now pared to the limit, the question is how much the order picture will change. Some analysts now do not believe the rate of steel consumption has been as high as they figured earlier.

In addition, there are heavy inventories of automobiles, appliances, farm implements, construction steel, and warehouse stocks. Even though actual steel stocks in hands of durable goods makers may not be high, there is no particular urgency for major steel orders at this time.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,513	1,203	1,775	1,097
Ingot Index				
(1947-1949—100)	94.2	74.9	110.5	68.3
Operating Rates				
North East Coast	59.0	50.0*	69.0	41.0†
Buffalo	54.0	48.0*	60.0	104.0†
Pittsburgh	45.0	35.0	60.0	50.0†
Youngstown	32.0	13.0	42.0	30.0†
Cleveland	46.0	42.0	66.0	24.0†
Detroit	83.0	70.0	82.0	33.0†
Chicago	60.0	46.0*	64.0	35.0†
Cincinnati	51.0	26.0*	63.0	83.0†
St. Louis	52.0	52.0*	74.0	89.0†
South	64.0	42.0*	65.0	81.0†
West	61.0	64.0*	69.0	32.0†
U. S. Rate	53.1	42.2	62.3	38.7

* Revised. †IRON AGE Estimate.
Source: American Iron And Steel Institute

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$31.17	$31.00	$31.50	$39.17
No. 2 bundles	$21.17	$20.83	$20.83	$27.00
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	26.80
Copper, electrolytic	33.00	33.00	33.00	31.50
Lead, St. Louis	11.80	11.80	11.80	11.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	102.625	102.625	101.25	102.50
Zinc, E. St. Louis	13.00	13.00	13.00	11.00

History Pays Off in Purchasing

Walter W. Parmer, director of purchases, John J. Nesbitt, Inc., uses historical data to aid in making buying decisions.

The result is a well balanced and efficient buying system.

■ Perhaps Walter J. Parmer, director of purchases for John J. Nesbitt, Inc., Philadelphia, should have been a historian. His high interest in the history of products used in Nesbitt's manufacturing has paid off in the form of a sound buying system.

Nesbitt makes heating and ventilating systems for schools, plants and other big installations. The company is growing rapidly and each year is using more and more metal in its production. And it's Mr. Parmer's job to see that the metals and other materials are on hand and in the right quantities when the need for them arises.

Long List — One way he does this is to keep five year records of all materials used. On a record card, each year is broken down to the individual months. Here the usage is tabulated. Using this, Mr. Parmer can predict accurately what amounts of a material will be needed to meet production demands at any given period.

Not only is materials usage recorded, but the amounts of each purchase, f. o. b. cost, terms, freight allowance, list price and discounts are also tabulated. He also keeps a record of the vendor of each product. This system, says Mr. Parmer, gives him an accurate picture of every item used in manufacturing.

Data Processing — Nesbitt now uses data processing to keep many of its purchasing records. But Mr. Parmer still uses the historical system on separate cards. It gives him information the mechanical system cannot, he says.

The materials control system for purchased components, involving an adaptation of the travelling requisitions, and of allocations against the inventory and on order positions, has largely been transferred to data processing.

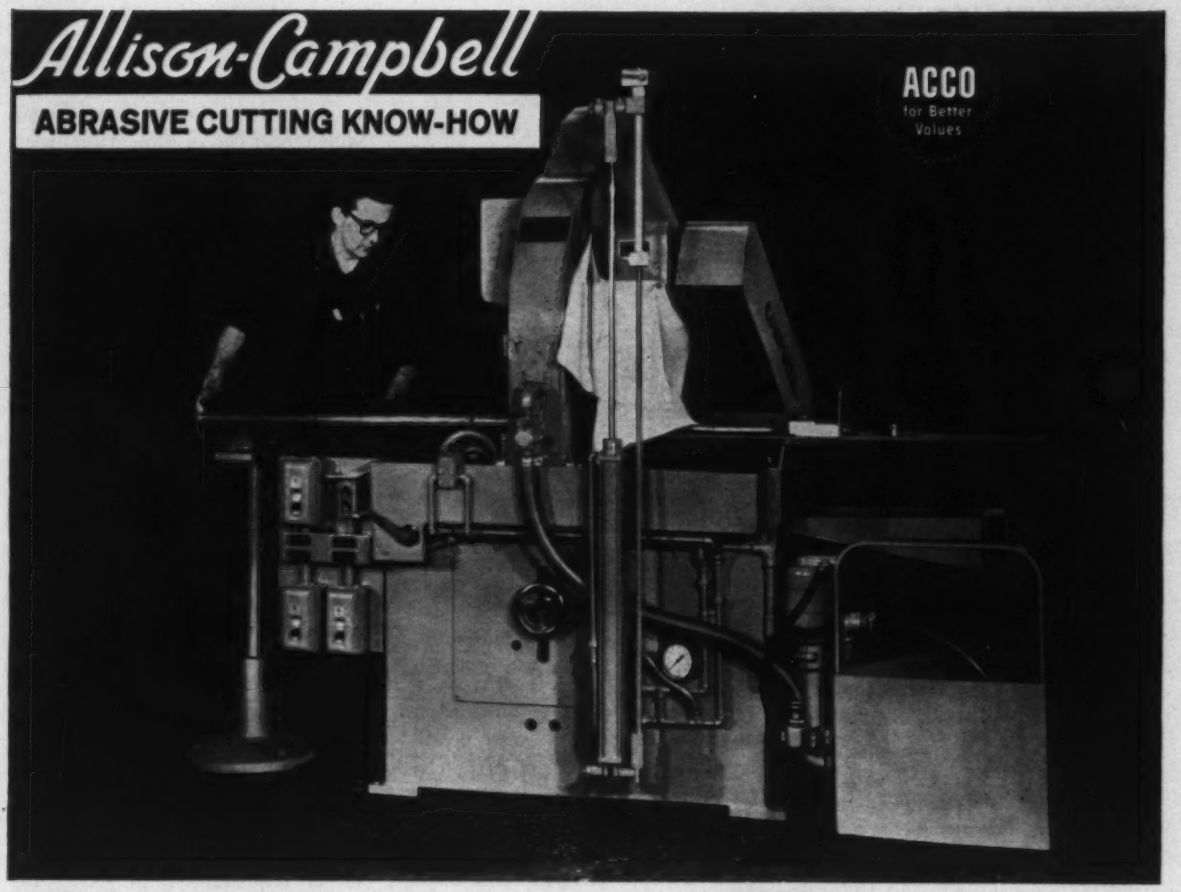
Old and New—Purchase of basic raw materials is currently being tailored to the electronic data processing system. But this transfer, says Mr. Parmer, is still several months in the future. Until then these purchases, which make the largest share of the company's materials expenditures, will be under Mr. Parmer's system.

In order to keep up on just what is available in the metals inventory, a bimonthly check is made to see what metals are on hand and what has been used. This information is weighed against the production forecast, revised monthly, and forward purchases are then made.

Scrap Cut — A few years ago Nesbitt started a drive to cut down on scrap. And here Mr. Parmer went into action. New metals orders were for material cut to lengths and widths as near as possible to those used in making heating and ventilating units. Also, steel waste was watched closely to see if it couldn't be used for a smaller part on a machine. The end result was a big saving.

Last year Nesbitt spent more than $10 million for manufacturing materials. Of this, more than $4 million went for metals. Again this year Nesbitt will spend over $4 million for steel, copper and aluminum.

W. W. PARMER: Knowing the product history pays.



With this Campbell Machine, you can--

Cut 6-inch Diameter Hard Alloys-Cleanly and Accurately-in Less Than 3 Minutes!

• This Campbell wet abrasive cutting machine—the Model 406—will cut tubing, bar stock, angle iron, or any other shape up to 6″ round or square—and it will cut practically *any* material, including the new super alloys and exotic metals. Like all Campbell machines, it's designed to give *accurate* cuts, quickly and cleanly.

HIGH SPEED—4 to 8 seconds per square inch is the normal cutting speed for all Campbell wet abrasive cutting machines. For instance, you can cut 6″ diameter hardened steel in less than 3 minutes.

ACCURACY—Campbell machines are production machine tools. They cut within close tolerances to reduce rejects and scrap loss. For example, the Model 406 will cut 3″ diameter material to lengths within ±.010″, 6″ diameter within ±.030″.

FINE FINISH—Additional finishing operations are rarely required. There is no burn, and burr has been reduced to an absolute minimum.

POWER OSCILLATION—On an oscillating-type machine such as the Model 406, the cutting wheel is moved horizontally back and forth *across* the cut as the wheel is fed downward. The result—greater cutting capacity, with longer wheel life.

PROPER COOLANT APPLICATION—Large reservoir and a 33 gallon/minute pump provide high volume of coolant. Unique Campbell distributor applies coolant equally to both sides of the wheel—an essential requirement for accurate cuts.

OTHER CAMPBELL MACHINES FOR ANY CUT-OFF NEED

Choose from four types of Campbell machines for wet or dry cutting—chop stroke, oscillating, horizontal or rotary—with capacities up to 14″ rounds, 12″ billets, plate up to 6″ thick and 20 ft. long.

Regardless of your application, you'll find that a Campbell machine provides you with the best cut-off method for modern production techniques—far more efficient, accurate and economical for cutting many materials than other cutting equipment.

WRITE FOR DETAILS—Bulletin DH-260 gives the complete story on the Campbell Model 406 abrasive cutting machine. We'll also be glad to send you information on other machines; just tell us your cut-off application. And remember—your Allison-Campbell Field Engineer is an abrasive cutting specialist. Call on him for expert advice.

ACCO

CAMPBELL ABRASIVE CUTTING MACHINES

Allison-Campbell Division • American Chain & Cable Company, Inc.

927 Connecticut Avenue, Bridgeport 2, Conn.

Steel Shipments Fell in May

May shipments of finished steel products fell by 400,000 tons from April.

Total shipments in the first five months of 1960 trailed last year by 3 pct for the period.

■ May shipments of finished steel products dropped to 6.27 million net tons, reports the American Iron and Steel Institute. This compares with April shipments of 6.7 million tons. And it trailed May, 1959, by 2.4 million tons.

Total steel shipments of 36.9 million tons during the first five months of 1960 were down 3 pct from the 38.2 million tons shipped last year. However, some products actually scored gains over a year ago.

New Sheet Record — Sheet and strip shipments set a new record of 15.1 million tons for the first five months. It was a gain of 207,000 tons over the previous high for the period set last year. Plate shipments during the period increased by 264,000 tons to 3.4 million tons. And heavy structural shape shipments rose 252,000 tons to 2.5 million net tons.

Rails and accessories, along with semi-finished products also made gains. Largest tonnage decreases occurred in pipe and tubing, tin mill products, and wire and wire products.

Less for Autos—Five major markets took less steel from mills during the period than they did in 1959. Automotive dropped to 7.55 million tons from 8.18 million tons. Warehouses and distributors took 6.73 million tons, down from 6.96 million tons.

Construction received 4.69 million tons compared with 4.84 million tons the year before. Containers dropped to 3.19 million tons from 3.64 million tons; and machinery, industrial equipment and tools accounted for 2.23 million tons against 2.3 million a year ago.

Sheet and Strip—A sharp pickup in flat-rolled products may be delayed, according to reports from **Detroit.** August orders had been shaping up well, but two automakers have set back part of their tonnage to September. In some cases, it amounts to 50 pct of the original order. As yet, mills aren't too concerned and August will show a good improvement over July. But optimism could change if deferrals continue. **East Coast** mills are still waiting for automotive suppliers to move into the market. Meanwhile, they offer fast delivery. Cold-rolled sheet is still one of the best products in **Pittsburgh** where relatively good bookings support the overall market. Mills are now publishing rolling schedules quoting delivery in three weeks or less in **Chicago.** All grades are loose.

Plate and Structurals — Orders are very spotty on the **East Coast.** Mills report two or three good order days are followed by little or no activity. In general, plate can be shipped in 2 to 4 weeks. Alloy plate is available in 7 weeks or less. Orders are being placed on such a short range basis that **Pittsburgh** mills hesitate to evaluate August. They say there's no sign of improvement.

Pipe and Tubing — Jobber discounts have been increased to 5 pct on standard pipe and miscellaneous linepipe. The discount had been lowered to 3 pct in 1958 on direct shipments. Earlier, mills had eliminated the jobber discount on shipments to stock. Now, the 5 pct discount is fully restored. Both U. S. Steel Corp.'s National Tube Div. and National Supply Co. have adopted the new prices. A new pipeline was cleared a week ago. However, **Chicago** mills aren't sure how much pipe may have been ordered earlier. A spotty and very minor improvement in jobber orders for standard pipe is reported in **Pittsburgh.** But there's no change in oil country seamless.

Specialties—Reduced production of vacuum-melted and other specialized steels is blamed on a lull in missile programs. **Pittsburgh** producers say the lag is caused by the timing of projects rather than economic conditions. Armco Steel Corp. has announced at **Middletown, O.,** that it has licensed Republic Steel Corp. to produce and sell precipitation-hardenable stainless steels developed and patented by Armco.

Wire — Revised price schedule has been announced by Atlantic Steel Co., **Atlanta, Ga.** The new schedule gives a functional allowance of 4 pct on net mill value of shipments made to and for jobbers. Order, commodity and item quantity extras have been eliminated. Minimum price base tonnage has been reduced to 30,000 lb.

PURCHASING AGENT'S CHECKLIST

Electronics and aerospace industries climb on list of top defense contractors. P. 63

Steel exports topped imports for first time in 17 months during May. P. 64

Machine tool leasing has benefits and drawbacks. P. 99

COMPARISON OF PRICES

(Effective July 12, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	July 12 1960	July 5 1960	June 14 1960	July 14 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	July 12 1960	July 5 1960	June 14 1960	July 14 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, South Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$30.50	$30.50	$31.50	$43.50
No. 1 steel, Phila. area	33.50	33.50	33.50	39.50
No. 1 steel, Chicago	29.50*	29.00	29.50	34.50
No. 1 bundles, Detroit	27.50	27.50	27.50	37.50
Low phos., Youngstown	33.50	33.50	34.50	44.50
No. 1 mach'y cast, Pittsburgh	48.50	48.50	49.50	51.50
No. 1 mach'y cast, Phila.	49.50*	50.50	51.50	49.50
No. 1 mach'y cast, Chicago	45.50	45.50	46.50	59.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$31.17*	$31.00	$31.50	$39.17
No. 2 bundles	21.17*	20.83	20.83	27.00
Coke, Connelsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.50-15.50	14.50-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$33.00	$33.00	$33.00	$31.50
Copper, Lake, Conn.	33.00	33.00	33.00	31.50
Tin, Straits, N. Y.	102.625*	102.625	101.25	102.50
Zinc, East St. Louis	13.00	13.00	13.00	11.00
Lead, St. Louis	11.80	11.80	11.80	11.80
Aluminum, virgin ingot	28.10	28.10	28.10	26.80
Nickle, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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* Appears in the July 7 - July 21 issues.

800 to 1 hp favorites for quiet operation, low maintenance and long-life service . . .

From the case of the A. O. Smith Motor Man — a complete stable of integrals that include single-phase models (1-5 hp) or polyphase (1-800 hp). Also a team of fractional-hp motors. All are sure bets to give top performance over the long, long haul.

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Milwaukee 1, Wisconsin, U.S.A.

Higher RR Lists Slow Downtrend

Railroad lists brought higher-than-expected prices in a still soft market.

Some scattered activity and dealer resistance indicate bottom may be reached.

■ An upward surge of railroad lists brings a firmer tone for a still dull scrap market.

Exports continue to be the main source of activity in the East where the market remains quiet. Several dealers report ships are taking on heavy July cargoes and plan active export business in August.

Mills are generally buying at the same prices as last month and quantities are small. However, brokers in key locations claim some dealer resistance.

Further Drops—The Midwest reports a fair advance in railroad lists, but a very weak situation among the mills. Further drops in scrap collections are indicated by stiffer dealer prices.

The picture is probably the darkest on the West Coast where dealers are frowning about the outlook for the rest of the summer. Exports continue to absorb the small amount of scrap moving into this market.

Pittsburgh—The market here remains quiet, but there are signs of firmness and even strength. A mill on the fringe of the district is paying the same prices as last month for No. 1 heavy melting and No. 2 heavy melting. Railroad lists brought surprisingly high prices.

Chicago—Railroad lists advanced 25¢ to 50¢ on broker purchases, though mill activity continues weak. After the purchases were reported last week, local mill buying again slackened. Dealer prices are somewhat stiffer, reflecting further drops in scrap collections. Industrial scrap tightened again.

Philadelphia — Export orders maintain a brisk pace with the domestic market still dull. The only recent activity in open-hearth grades was a 4000 ton sale to a local mill at existing prices. Four or five export cargoes are loading this month with others expected in August.

New York — Scrap receipts are falling off seasonally. But buying for export is also easier. So the market stays balanced at current levels. Little if any change is forecast in steelmaking grades through this month and next.

Detroit — The feeling is more widespread that the market has reached its low point. Although there hasn't been much of a pickup in orders, there have been some sales this month. Some dealers think the August industrial list will be slightly stronger than July.

Cleveland — Prices are showing more firmness here but there is little or no mill interest behind this development. Railroad lists brought generally higher prices and dealers are unwilling to sell at the present levels. In the Valley, this condition has brought reports that the next mill purchase will be higher.

St. Louis — Collections in this market are off as much as 65 pct from last month. Yards prefer to lay down scrap, however, rather than write new orders at existing price levels. Dealers' prices are firm. Broker buying prices seem to be getting stronger. Mill purchasing is still very low.

Cincinnati—Prices are unchanged but firmer here. Mills are buying at the same prices as last month and quantities are small. However, brokers report they are running into dealer resistance. There is not enough activity for this attitude to produce higher prices but the market has developed a stronger tone.

Birmingham — Openhearth consumers continued to be out of the market during the past week. One large electric furnace purchased its scrap needs for the month and then announced it would not buy again until August. Otherwise the market continues slow with very little movement.

Buffalo—Purchases of No. 2 bundles were made at $1 less than the quoted prices, dropping the price of this item. There was a reported sale of low phos plate to an area mill for $3 less than the last sale. Sales have been too small to set any pattern.

Boston—It's the same old story here: A little export keeping the market alive. Domestic action is practically nothing. Things are generally inactive due to the vacation season.

West Coast—Exporting continues strong enough to absorb the reduced amount of scrap flowing into the market. Most dealers are pessimistic about a business pickup before September.

Houston—A district mill entered the market for a small amount of No. 2 heavy melting and No. 2 bundles. As a result prices on the two melting grades declined $2 while the price on bundles dropped $1. Export activity continues here at prices corresponding to those of the domestic market. Last week, prices for No. 1 heavy melting, No. 2 heavy melting and No. 2 bundles were misquoted. They should have been: No. 1 heavy melting, $32; No. 2 heavy melting, $29; and No. 2 bundles, $18.

SCRAP PRICES *(Effective July 12, 1960)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	17.00 to 18.00
Low phos. punch'gs plate	37.00 to 38.00
Heavy turnings	27.00 to 28.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	39.00 to 40.00
Stainless	
18-8 bundles and solids	195.00 to 200.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	105.00 to 110.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	28.00 to 30.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Low phos. forge crops	40.00 to 41.00
Low phos. punch'gs plate, ¼ in. and heavier	34.00 to 35.00
Low phos. 2 ft. and under	32.00 to 33.00
No. 1 RR hvy. melting	33.00 to 35.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	50.00 to 51.00
Rails 2 ft. and under	47.00 to 48.00
Angles and splice bars	41.00 to 42.00
RR steel car axles	47.00 to 48.00
RR couplers and knuckles	38.00 to 39.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	40.00 to 41.00
Cast iron wheels	31.00 to 32.00
Malleable	43.00 to 44.00
Stove plate	34.00 to 35.00
Steel car wheels	37.00 to 38.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	85.00 to 90.00
430 turnings	40.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Clean cast. chem. borings	23.00 to 24.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. 2 ft punch'gs	39.00 to 40.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	27.00 to 28.00
RR specialties	39.00 to 40.00
Rails, 18 in. and under	54.00 to 55.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Cast iron car wheels	41.00 to 42.00
Malleable	45.00 to 46.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. and under	33.00 to 34.00
Rails, random length	43.00 to 44.00
Rails, 18 in. and under	50.00 to 51.00
No. 1 cupola cast.	35.00 to 36.00
Hvy. breakable cast.	32.00 to 33.00
Drop broken cast.	47.00 to 48.00

Youngstown

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	33.00 to 34.00

Cleveland

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	29.00 to 30.00
No. 1 factory bundles	32.00 to 33.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft & under	36.00 to 37.00
Drop forge flashings	29.00 to 30.00
Low phos. punch'gs plate	30.00 to 31.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR hvy. melting	34.00 to 35.00
Rails 2 ft and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	47.00 to 48.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	39.00 to 40.00
Malleable	47.00 to 48.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	75.00 to 80.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 busheling	29.00 to 30.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Low phos. plate	36.00 to 37.00
Structurals and plate, 2 ft and under	39.00 to 40.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft and under	47.00 to 48.00
No. 1 machinery cast.	46.00 to 47.00
No. 1 cupola cast.	42.00 to 43.00

St. Louis

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	27.00 to 28.00
Foundry steel, 2 ft	30.00 to 31.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	18.00 to 19.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	18.00 to 19.00
No. 1 RR hvy. melting	31.00 to 32.00
Rails, random lengths	35.00 to 36.00
Rails, 18 in. and under	39.00 to 40.00
RR specialties	38.00 to 39.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	33.00 to 34.00
Stove plate	35.50 to 36.50
Cast iron car wheels	35.00 to 36.00
Rerolling rails	47.00 to 48.00
Unstripped motor blocks	36.00 to 37.00

Birmingham

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	8.00 to 9.00
Electric furnace bundles	32.00 to 33.00
Elec. furnace, 3 ft & under	32.00 to 33.00
Bar crops and plate	36.00 to 37.00
Structural and plate, 2 ft.	35.00 to 36.00
No. 1 RR hvy. melting	28.00 to 29.00
Scrap rails, random lgth.	39.00 to 40.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	37.00 to 38.00
No. 1 cupola cast.	46.00 to 47.00
Stove plate	46.00 to 47.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	36.00 to 37.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turnings	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	165.00 to 170.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 dealer bundles	27.00 to 28.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	24.00 to 25.00
Drop forge flashings	24.00 to 25.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	11.00 to 12.00
Heavy breakable cast.	29.00 to 30.00
Mixed cupola cast.	33.00 to 34.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	60.00 to 65.00
430 bundles and solids	60.00 to 65.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $24.50
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 24.50
No. 2 bundles	14.00 to 15.00
No. 1 busheling	24.00 to 24.50
Machine shop turn.	5.00 to 6.00
Shoveling turnings	6.50 to 7.50
Clean cast. chem. borings	12.00 to 13.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	26.50 to 27.50

San Francisco

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	30.00
No. 2 bundles	20.00
Machine shop turn.	$14.00 to 15.00
Cast iron borings	14.00 to 15.00
No. 1 cupola cast.	46.00

Los Angeles

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 1 dealer bundles	27.00
No. 2 bundles	17.00
Machine shop turn.	13.00
Shoveling turnings	15.00
Cast iron borings	$15.00 to 16.00
Elec. furnace 1 ft and under (foundry)	42.00 to 43.00
No. 1 cupola cast.	42.00 to 43.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$25.80
No. 2 hvy. melting cut 3 ft. and under	22.50
No. 1 dealer bundles	25.80
No. 2 bundles	19.00
Mixed steel scrap	16.00
Bush., new fact., prep'd	25.50
Bush., New fact., unprep'd	20.45
Machine shop turn.	12.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	33.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 2 bundles	18.00
Machine shop turn.	12.00
Shoveling turnings	14.00
Cut structural plate 2 ft & under	$40.00 to 41.00
Unstripped motor blocks	26.00 to 27.00
Cupola cast.	32.00 to 33.00
Heavy breakable cast.	25.00 to 26.00

Imports and Exports Come Under Attack

With domestic market dull, the problems of nonferrous imports and exports are getting study.

Smelters want limits on aluminum scrap exports. Domestic brass mills oppose any tariff reductions on imported products.

■ The U. S. nonferrous market is in the summer doldrums. But with domestic sales dull, the industry is giving attention to the long-range problem of imports and exports.

One important reason for the interest is the tariff cutting session scheduled for September in Geneva by the General Agreement on Tariffs and Trade. Heading the list of items on which the U. S. delegation is apparently ready to give some tariff concessions:

"Articles and wares not specially provided for if composed wholly or in chief value of iron, steel, copper, brass, nickel, pewter, zinc, aluminum or other metal."

Meeting Next Month—In mid-August, a meeting of leaders of all parts of the aluminum industry is scheduled for Washington under the general heading of import and export problems. One source says the current agenda calls only for discussion on how to boost exports. But other industry sources suggest the agenda might be broadened once industry leaders actually start their closed sessions.

One indication: Late last week the Commerce Dept. decided to turn down the request of the Aluminum Smelters Research Institute for a restriction on exports of aluminum scrap.

Shortage Lacking — Assistant Secretary for Domestic Affairs Carl F. Oechsle decided, on the basis of all the evidence he could accumulate, that: (1) there is no shortage of aluminum in the U. S., and (2) the current rate of export of aluminum scrap is having no adverse effect on the U. S. economy.

Carl Burton, executive secretary of the smelter group, had not been officially informed of the rejection when he was questioned by The IRON AGE.

Nevertheless, he said that he and his group did not intend to give up the fight for export quotas on scrap. He said they were "not worried about today or tomorrow, but the years to come."

Mr. Burton pointed out he would be at the Washington meeting and hinted he might bring the issue up if the opportunity presented itself.

Focus on Exports—Another industry leader, who will also be at the meeting, agreed that as of now "the emphasis will be on exports." He noted that imports this year are running below last year, while exports are up.

But he said further, that "the basic condition of built-in cost advantages for foreign producers" still exists. He inferred that he would probably not just sit back if a discussion of the import problem came up.

Imports Worry Mills—The situation is somewhat different in the copper industry. The Copper and Brass Research Assn. at the end of June filed a statement before the Tariff Commission and the Committee for Reciprocity Information strenuously opposing any reduction of tariff or excise taxes on brass mill products.

T. E. Veltfort, managing director of CABRA said, "the domestic brass mills are already suffering from the heavy inroads of imports."

A spokesman for the brass importers says his group has prepared a thorough and convincing argument for the other side of the case. But the majority of the importers have voted to hold this back.

Magnesium

Shipments of wrought magnesium in May topped both the previous month and May, 1959, the Magnesium Assn. reports.

The 995 tons shipped this May is 11 pct better than the 895 tons shipped in April. In May, 1959, 822 tons of wrought magnesium were shipped.

Total shipments in 1960 through May, of 4503 tons, are just one pct better than the same period in 1959.

Tin prices for the week: July 6—102.75; July 7—102.75; July 8—102.50; July 11—102.625; and July 12—102.625*.

*Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	26.00	24.70	12/17/59
Aluminum ingot	28.10	26.80	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	33.00	35.00	3/11/60
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.80	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	38.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

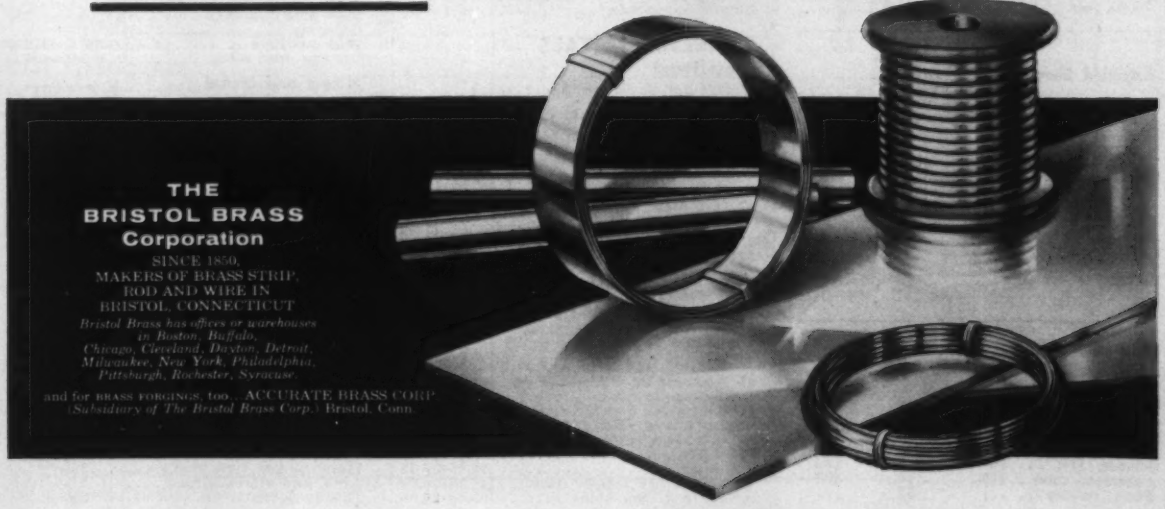
ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; **Other primary prices, pg. 142.**

At Bristol

"run of the mill"

always means

Brass at its Best



THE
BRISTOL BRASS
Corporation
SINCE 1850.
MAKERS OF BRASS STRIP,
ROD AND WIRE IN
BRISTOL, CONNECTICUT
Bristol Brass has offices or warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse.
and for BRASS FORGINGS, too... ACCURATE BRASS CORP. (*Subsidiary of The Bristol Brass Corp.*) Bristol, Conn.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.038	.048-.061	.077-.096	.136-.250
1100, 3003	47.8	47.3	46.2	45.1
5052	54.2	53.0	50.8	49.2
6061-0	51.0	49.8	47.9	46.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	44.7-46.2	53.2-60.8
18-32	45.2-46.8	57.7-79.9
33-38	48.8-51.4	83.3-94.5
39-44	58.7-62.4	99.9-121.9

Screw Machine Stock—2011-T-3

Size*	¼	⅝-⅜	½-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.822
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67.9	69.0	77.9	103.1
AZ31B Spec.		93.3	96.9	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	.....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	.....	48.68	58.78
Muntz Metal	53.20	.....	48.26	.....
Comm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	.....	52.21	.....
Phos. Bz. 5%	77.44	.....	78.10	.....

Free Cutting Brass Rod..... 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; Mar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.50
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb) ....$1.50 to $1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 29.95 to 36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% .....$9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury, dollars per 76-lb flask f.o.b. New York .....$210 to $212
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz...$82 to $85
Rhodium .....$137 to $140
Silver ingots (¢ per troy oz.).....91.375
Thorium, per kg. $43.00
Vanadium .....$ 3.65
Zirconium sponge .....$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 29.25
- No. 120 ..... 28.25
- No. 123 ..... 27.25

80-10-10 ingot
- No. 305 ..... 33.75
- No. 315 ..... 31.50

88-10-2 ingot
- No. 210 ..... 42.00
- No. 215 ..... 38.75
- No. 245 ..... 34.00

Yellow ingot
- No. 405 ..... 23.75

Manganese bronze
- No. 421 ..... 28.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 25.75-26.00
- 0.60 copper max. 25.50-25.75

Piston alloys (No. 132 type)..28.00-29.00
No. 12 alum. (No. 2 grade)....24.75-25.25
108 alloy 25.25-25.75
195 alloy 27.75-28.75
13 alloy (0.60 copper max.)...25.75-26.00
AXS-679 (1 pct zinc) 25.00-26.00

(Effective July 12, 1960)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 25.25-26.25
Grade 2—92-95% 24.00-25.00
Grade 3—90-92% 23.00-24.00
Grade 4—85-90% 22.50-23.50

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25⅝	25
Comm. bronze	26½	26
Mang. bronze	20⅝	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 26⅛
- No. 2 copper wire 24½
- Light copper 22¼
- *Refinery brass 22½
- Copper bearing material 21½

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 26¾
- No. 2 copper wire 24
- Light copper 21¾
- No. 1 composition 20½
- No. 1 comp. turnings 20
- Hvy. yellow brass solids 15
- Brass pipe 14
- Radiators 16

Aluminum

- Mixed old cast. ..... 13½—14
- Mixed new clips ..... 15 —15½
- Mixed turnings, dry ..... 14 —14½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 22¾—23
- No. 2 copper wire ..... 20½—21
- Light copper ..... 18½—19
- Auto radiators (unsweated).. 12½—13
- No. 1 composition ..... 17 —17½
- No. 1 composition turnings... 15½—16
- Cocks and faucets ..... 13 —13½
- Clean heavy yellow brass ... 11¾—12¼
- Brass pipe ..... 13½—14
- New soft brass clippings .... 14 —14½
- No. 1 brass rod turnings .... 11½—12

Aluminum

- Alum. pistons and struts .... 7½— 8
- Aluminum crankcase ..... 11¼—11¾
- 1100 (2s) aluminum clippings 15 —15½
- Old sheet and utensils ..... 11¼—11¾
- Borings and turnings ..... 7 — 7½
- Industrial castings ..... 11¼—11¾
- 2020 (24S) clippings ..... 12½—13

Zinc

- New zinc clippings ..... 7 — 7¼
- Old zinc ..... 4½— 5
- Zinc routings ..... 3¼— 3½
- Old die cast scrap ..... 2¾— 3

Nickel and Monel

- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 28-29
- Clean Monel turnings 20-23
- Old sheet Monel 24-26
- Nickel silver clippings, mixed 18
- Nickel silver turnings, mixed 15

Lead

- Soft scrap lead ..... 8 — 8½
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

Miscellaneous

- Block tin ..... 75 —76
- No. 1 pewter ..... 55 —56
- Auto babbitt ..... 39 —40
- Mixed common babbitt ..... 9¾—10¼
- Solder joints ..... 13¼—13¾
- Siphon tops 41
- Small foundry type ..... 9¾—10¼
- Monotype ..... 9¾—10¼
- Lino. and stereotype ..... 8¾— 9
- Electrotype ..... 7½— 7¾
- Hand picked type shells ..... 5¼— 5¾
- Lino. and stereo. dross ..... 2¼— 2¾
- Electro dross ..... 2¼— 2¾

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Castle, Pa.									7.425* *M8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W3*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

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STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.825 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.825 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Pontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *G7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

? Electrogalvanized sheets.

(Effective July 12, 1960)

*7.425 at Sharon-Niles is 7.225

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, B5*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective July 12, 1960) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore**	$.10	8.37	9.71	10.16	10.78	8.94	9.63	9.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	.....	.....	.....
Boston**	.10	9.84	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	8.95	10.10	11.30	10.80	9.15	9.80	9.15	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.99	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.31	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72[1]	10.13	11.39	11.01	8.80	9.45	9.11	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	9.15	10.61	11.45	10.92	9.19	10.04	9.30	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	9.65	12.19[3]	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.36	11.02	11.50	11.02	9.25	9.95	9.46	11.72	17.17	15.87	21.87	21.12
Los Angeles**		9.59[1]	11.29	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.99	10.20	.....	11.39	10.27	10.48	10.07	12.89	.....	.....	.....	.....
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	9.13	11.04	17.24	16.24	21.24	20.49
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.48	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia**	.10	8.95	9.70	10.76	10.95	9.30	9.95	9.35	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	9.00	11.40	17.10	16.10	19.70	20.45
Portland**		10.20	12.05	12.35	12.20	10.35	10.80	10.20	16.65	18.50	17.45	20.75	20.25
San Francisco**	.10	10.27	11.79[2]	11.55	11.88	10.48	10.50	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.07	11.44	12.05	11.84	10.17	10.50	9.96	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.07	11.44	12.05	11.84	10.17	10.50	9.96	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.75	10.68	11.09	8.77	9.29	8.97	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.74	10.99	11.16	8.83	9.33	8.97	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅛" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective July 12, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S5*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)	Pct
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)	Pct
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mills

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective July 12, 1960)

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	43.75	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville Pa., *U2*; Detroit, *M2*; Detroit, *S1*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *R5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5, R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Ambridge, Pa., *B7*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Newark, N. J. *D2*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R5*; Reading, Pa., *C2*; Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Ambridge, Pa., *B7*; Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Ambridge, Pa., *B7*; Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; wensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Reading, Pa., *C2*.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Am'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	.....	212	193	9.00	9.55
Aliquippa *J3****	173	190	.....	.....	190	9.00	9.675
Atlanta *A8***	173	191	.....	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	193	.....	214	199	9.10	9.85
Donora, Pa. *A5*	173	187	.....	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	.....	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	.....	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	.....	219	203	9.10	9.775
Johnstown *B3***	173	190	177	.....	196	9.00	9.675
Joliet, Ill. *A5*	173	187	.....	212	193	9.00	9.55
Kokomo *C9**	175	189	.....	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	.....	217	198	9.25	9.80†
Minnequa *C6*	178	192	182	217	198	9.25	9.80†
Palmer, Mass *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
SparrowsPt. *B3***	175	.....	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. ** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	139.8
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	33.00
Neville, Is., Pa.	30.75

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EXTRA HEADERDIE (type W1-2D)

The fastener industry's first choice die steel

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COLUMBIA TOOL STEEL COMPANY
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QUALITY — the manufacturing or fabrication of vacuum furnaces, vacuum crucibles and ingot molds are **not ordinary metal working jobs.** Quality depends on . . . .

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ZAK MACHINE WORKS INC.
TROY (GREEN ISLAND) N. Y.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Castle, Pa. *M10*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

Rolled elliptical, 18 in. or longer, 5000 lb lots 48.00

Electrodeposited, 5000 lb lots ... 39.50

Brass, 80-20, ball anodes, 2000 lb or more 53.00

Zinc, ball anodes, 2000 lb lots 20.50

(for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb 1.0225

(Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb 1.40

Tin, ball anodes $1.05 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum..... 65.90

Copper sulphate, 25.2 Cu min, 6000 to 12,000 lbs per cwt $13.75

Nickel sulfate, 5000 to 23,000 lbs... 29.00

Nickel chloride, freight allowed, 100 lb 45.00

Sodium cyanide, domestic, f.o.b. Chicago, 200 lb drums 25.00

Zinc cyanide, 100 lb 60.75

Potassium cyanide, 100 lb drum N. Y. 45.50

Chromic acid, flake type, 10,000 lb or more 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50

Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75

Carbonyl Iron (200 lb lots) 88.00

Welding Grades 8.10

Cutting and Scarfing Grades 9.85

Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades

Electrolytic, domestic, f.o.b. shipping point. 15.00†

Atomized ..... 46.5 to 64.5

Reduced ..... 15.00†

Chemically Precipitated 15.00†

Brass, 5000-lb lots ..... 35.1 to 52.2

Bronze, 5000-lb lots ..... 53.1 to 56.7

Chromium, electrolytic 5.00

Lead ..... 7.50†

Manganese, electrolytic ... $1.00

Molybdenum .....$3.60 to $4.35

Nickel $1.15

Carbonyl Nickel, 20,000 lb lots $1.01

Nickel-Silver, 5000 lb lots.. 60.7 to 69.0

Silicon 70.00

Solder ..... 7.00†

Stainless Steel, 316 ..... $1.07

Stainless steel 304 ..... 89.00

Tin ..... 14.00†

Titanium, 99.25 + pct, per lb, f.o.b. $11.25

Tungsten .....$3.15 (nominal)

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type Cladding	Plate (*L4, C4, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
302	.....	.....	.....	37.50
304	28.80	31.55	34.30	40.00
316	42.20	46.25	50.25	58.75
321	34.50	37.75	41.05	47.25
347	40.80	44.65	48.55	57.00
405	24.60	26.90	29.25	.....
410	22.70	24.85	27.00	.....
430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 44.20; 1 side, 36.80.

(Effective July 12, 1960)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.... $185.00

High duty (except Salina, Pa., add $5.00) 140.00

Medium duty 125.00

Low duty (except Salina, Pa., add $2.00) 103.00

Ground fire clay, net ton, bulk... 22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00

Childs, Hays, Latrobe, Pa. 163.00

Chicago District 168.00

Western Utah 183.00

California 165.00

Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 163.00-168.00

Silica cement, net ton, bulk, Latrobe 29.75

Silica cement, net ton, bulk, Chicago 26.75

Silica cement, net ton, bulk, Ensley, Ala. 27.75

Silica cement, net ton, bulk, Mt. Union 25.75

Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.$109.00

Standard chemically bonded, Curtiner, Calif. 119.00

Burned, Balt. 103.00

Magnesite Brick

Standard, Baltimore $140.00

Chemically bonded, Baltimore 119.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk. $73.00

Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk 46.00

in sacks 52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio $16.75

Missouri Valley 15.60

Midwest 17.00

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

GUARANTEED—RE-NU-BILT

Electric Power Equipment — A. C. Motors

3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	800	Whse.	CW	500	1776
1	800	G.E.	MT-428	2200	450
1	600	Whse.	CW	220/440	900
1	600	Whse.	CW-4-32D-15	440	1778
1	550	Whse.	CW	440	252
1	500	Whse.	CW	550	350
1	300	A.C.	ANY	440/2300	720
1	300	G.E.	MTP561	2200	1800
1	250	G.E.	IM-16	220/440	875
1	250	A.C.	ANY	550	600
1	250	Cr.Wh.	Size 29Q	2300	350
1	250	G.E.	MT-424Y	4000	257
1	200	G.E.	IE-13B	220	1800
2	200	Whse.	CW-890	2560	1775
1	200	G.E.	IM	440	435
1	150	G.E.	IM-17	440	435
1	200	G.E.	IM	2200	580
1	125	G.E.	MT-557	220/440	1200
3	100	A.C.		440	695

SQUIRREL CAGE

1	500	G.E.	FT-559AY	2200	3600
2	500	Whse.	CSP-583H	440	3600
1	500	Whse.	CS-1115	2200	863/445
4	500	Whse.	CS-1216	2200	500
2	450	Ell.	F-3910	2200	1200
1	400	Whse.	CS-7151 610H	6600/4000	3585
1	300	Whse.	CS-1002	2300/440	600
1	250	Whse.	CS-875S	2200	1775
1	200	Whse.	CSP-581S	449	3450
2	200	Whse.	CS-855S D.P.	220/440	1750
1	200	Whse.	CS-873C	2200	1160
1	150	G.E.	FT-558	2200	875
1	150	Whse.	CS	440	580
1	125	Whse.	CS-764C	220/440	1160
3	100	Whse.	CS-760C	2200/440	1100
1	100	Whse.	B.B.CS-607	220/440	1790

SYNCHRONOUS

1	6000	G.E.	ATI.8	200/6600	600
1	3500	G.E.	TS 1.0	4600/2300/4000	360
2	1750	G.E.	ATI	2300	3600
1	700	G.E.	TS.8P.F.	2300	1200
1	400	G.E.	TS-7563S	2200	1200
2	350	G.E.	ATI 1.0P.F.	2300	150
1	325	G.E.	ATI 1.0P.F.	140	1800
2	300	El Mach.	BRKT	2200	1200

BELYEA COMPANY, Inc.

47 Howell Street, Jersey City 6, N. J.

Tel. OL 3-3334

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SLIP RING MOTORS

3 Phase—60 Cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
1**	5000	Ideal	Mill	6600/4160	440
1**	2500	G.E.	Mill	2300	296
1**	2500	G.E.	Mill	6600/4160	257
1**	1800	Whse.	Mill	2300	252
1**	1750	Whse.	Mill	2300	234
1**	1500	Al.Ch.	Mill	2300	508
1**	1300	Al.Ch.	Mill	2300	353
1**	1200	Al.Ch.	Mill	2300	505
1**	900	Al.Ch.	Mill	2300	160
1*	700	Whse.	CW-1224A	2300	585
1	500	Al.Ch.	ANY	2300	1175
1	500	Ideal	S-4-20	4600	705
1*	500	Al.Ch.	ANY	2200	505
1**	500	Al.Ch.	ANY	2300	293
1*	400	Al.Ch.	ANY	2300	505
1	400	Whse.	CW	2300	290
3	350	G.E.	I-M	2200	1180
1	300	G.E.	IE-15B	440	1200
1	300	Whse.	CW-1012	2200	704
1	250	Whse.	CW	4100/2400	710
1	250	Cr.Wh.	SR size Q	4600/2300	350
1	250	G.E.	MT-414	2200	300

**—Heavy duty, pedestal bearing, stator shifting bases.

*—Heavy duty, pedestal bearing, standard base.

OUTDOOR CIRCUIT BREAKERS

(Air—3-Pole)

Qu.	Amps.	KV	Make	Type	Int.	Cap.
3	1200	14.4	G.E.	ARA	1000	M.V.A.
2	1200	5	G.E.	AM	100	M.V.A.

(Oil—3-Pole)

1	400	73	Whse.	G-11	500	M.V.A.
1	600	69	G.E.	FK-329	500	M.V.A.
1	600	37	G.E.	FHKO-336	500	M.V.A.
1	400	37	G.E.	FHKO-136	250	M.V.A.
1	600	34.5	Al.Ch.	FZO-50-34X	250	M.F.A.
1	600	7.2	G.E.	FKO-227	50	M.V.A.

Transformer & Switchgear Package

3—833-KVA Allis-Chalmers Transformers, 1 ph., 60 cy., 13475/12375-11000/10175-V. Prim., 2300/4000-V. Secondary

1—G.E. Mag. outdoor O.C.B., type F.L.O., 600 amps., 14.4-KV, 250-MVA, int. cap.

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.

Cable Address "Macsteel" Philadelphia, Pa.

Phone Davenport 4-8300

Outlook Is Good For Late Summer

Used machinery dealers in New York are forced to hustle for business. But the overall picture for the rest of the year is good.

Changes have been noted in buyers' attitudes. And the life span of machinery is becoming shorter.

■ July brought a few additional smiles to the faces of New York machinery dealers.

"I just closed a good-sized transaction," said one New York dealer, "and that makes July a good month for me."

Another, who sells nationally, says, "We are picking up a little here and there, and at the end of the week we have our volume. There's business to be had, but you have to hustle for it more than ever before."

New York machine dealers generally agree that business is slightly better than it was one month ago. But the upturn has been "very slight" and it wouldn't take too much to knock it down again.

Dealers Optimistic—Despite the past record of this market, dealers are optimistic about remaining 1960 business. A pickup is expected by most, but there is variety of opinion as to when.

One dealer looks for numerous government contracts to follow the national political conventions. "The Administration wants good business at election time," he says. In order to present a good economic picture in early November, contracts would have to be placed by late summer.

Another dealer isn't quite as optimistic. He points out that auto changeovers and the upcoming show of new streamlined machine tools have buyers generally holding back.

Inquiries High—But the overall picture finds dealers pretty much in agreement that they will feel an upturn, especially in the fabricating business, in the near future. The rate of inquiries continues to be high for the number of orders placed. Also, the delay between inquiry and order is not caused by any lack of good equipment.

A change has been noted in the buyers' attitude toward the age of the equipment that will be considered.

"I can't give away the post-World War II stuff anymore," says one, "now everyone wants post-Korean War equipment."

A Radical Change—The same trend has been cited by others who claim this is especially true in machine tools rather than fabricating equipment such as presses, brakes and shears. Even the condition of the equipment does not appear to be the important factor. Buyers have apparently been convinced, say the dealers, that there has been such a radical change in the design and engineering of machinery in the last decade that anything dated prior to 1945 is obsolete.

In terms of marketability, the life span of machinery is becoming shorter. Dealers expect the high cost of new machines to keep the used machinery market fairly stable for the next five years.

COMPRESSORS

No better values at any price

100 CFM	100 psi	6 x 7 Ing. or Worth.
138 CFM	100 psi	7 x 7 Ing.—CPT—Worth.
142 CFM	125 psi	Ingersoll Rand Type 40-Jaeger
183 CFM	150 psi	7 x 7 Joy WG9
191 CFM	300 psi	9-4½ x 9 ES-2
194 CFM	125 psi	7-7-6 x 5 Worth. M40
234 CFM	100 psi	9 x 9 Ing.—Worth. Chic Pneu
290 CFM	75 psi	10 x 9 Ing. ES-1
364 CFM	100 psi	10 x 9 Joy WG9
465 CFM	100 psi	12 x 11 IR—Amer.
502 CFM	125 psi	12 x 13 Ing. Rand.
585 CFM	100 psi	15-9½ x 12 Ing.
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Broach, 10 ton 66" stroke, Oilgear, double slide, vertical, hydraulic, surface
Cut-off, No. 3 Modern, MD
Drill, Hy. Dy. 20" swing No. 217 Baker Bros. box column
Drill, Deep Hole, W. F. & John Barnes Model 420 horizontal, late
Drill, Multiple, Model B2A Natco holesteel, hydraulic
Drill, Sensitive, 27" swing Leland Gifford 4 spindle, mtr. on spindle
Drill, Driver, 26" swing No. 25 Ex-Cell-O vertical hydraulic box column
Gear Chamferer, Sheffield Model 343, type C, new December 47
Grinder, Centerless, No. 12 Landis
Grinder, Cylindrical, 22" x 72" Landis type C plain hydraulic
Grinder, Internal, No. 271 Heald plain, swivel work head
Grinder, Internal, No. 24-36 Bryant hole grinder
Grinder, Surface, 12" x 12" x 48" Thompson
Grinder, Thread Model 33 Ex-Cell-O automatic precision
Keyseater, No. 3 Baker
Lathe, Automatic, Model 3D Gisholt Simplimatic, hard ways, late
Lathe, Engine, 25" x 72" cc 12' 9" bed Axelson Model E, hy. dy. geared head
Lathe, Production, 15" x 30" cc Lipe Carbomatic, hydraulic
Lathe, Turret, No. 2 Warner & Swasey with new electric bar feed
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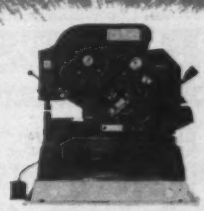

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No. 81 Heald Sizematic, m.d., 1944, cheap
No. 104 Rivett, m.d.
No. 172 Heald Plain Adjustable Gap Hydraulic, m.d.
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No. 20—10 x 18" cap. Brown & Sharpe Plain, m.d.
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6x18" Landis Type C Hydraulic, m.d., late
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10x18" Cincinnati Plain Hydraulic, Model ER, m.d., Filmatic Spindle, 1943
10x18" Norton Type C, m.d., latest
10x18" Cincinnati Model ER Plain, m.d.
10x36" Cincinnati Hydraulic, model EA, m.d.
10x36" Norton Type C, m.d.
10x36" Landis Type CH Plain, m.d.
10x48" Cincinnati Model ER Plain Hydraulic, m.d.
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NOBLE vacuum plate and sheet lifter, new 1958, 5000# cap., 10 adj. arms, adj. to 60" x 21' 4".
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Max Dia Closed: 17'-9"
Max Dia Opened: 18'-8"
Max Dia Bottom Opening 12'-6"
Distance from Eye of Bale to Bottom of Bucket Open and Closed: 14'-0"
Weight: 48,000 lbs

BOX H-83
c/o The IRON AGE, Chestnut at 56th, Phila. 39

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c/o The IRON AGE, Chestnut at 56th, Phila. 39

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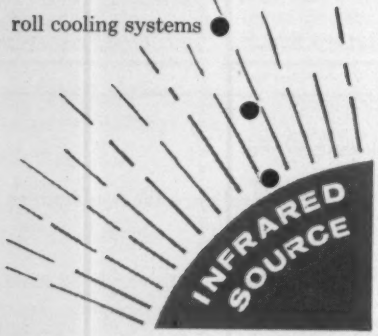

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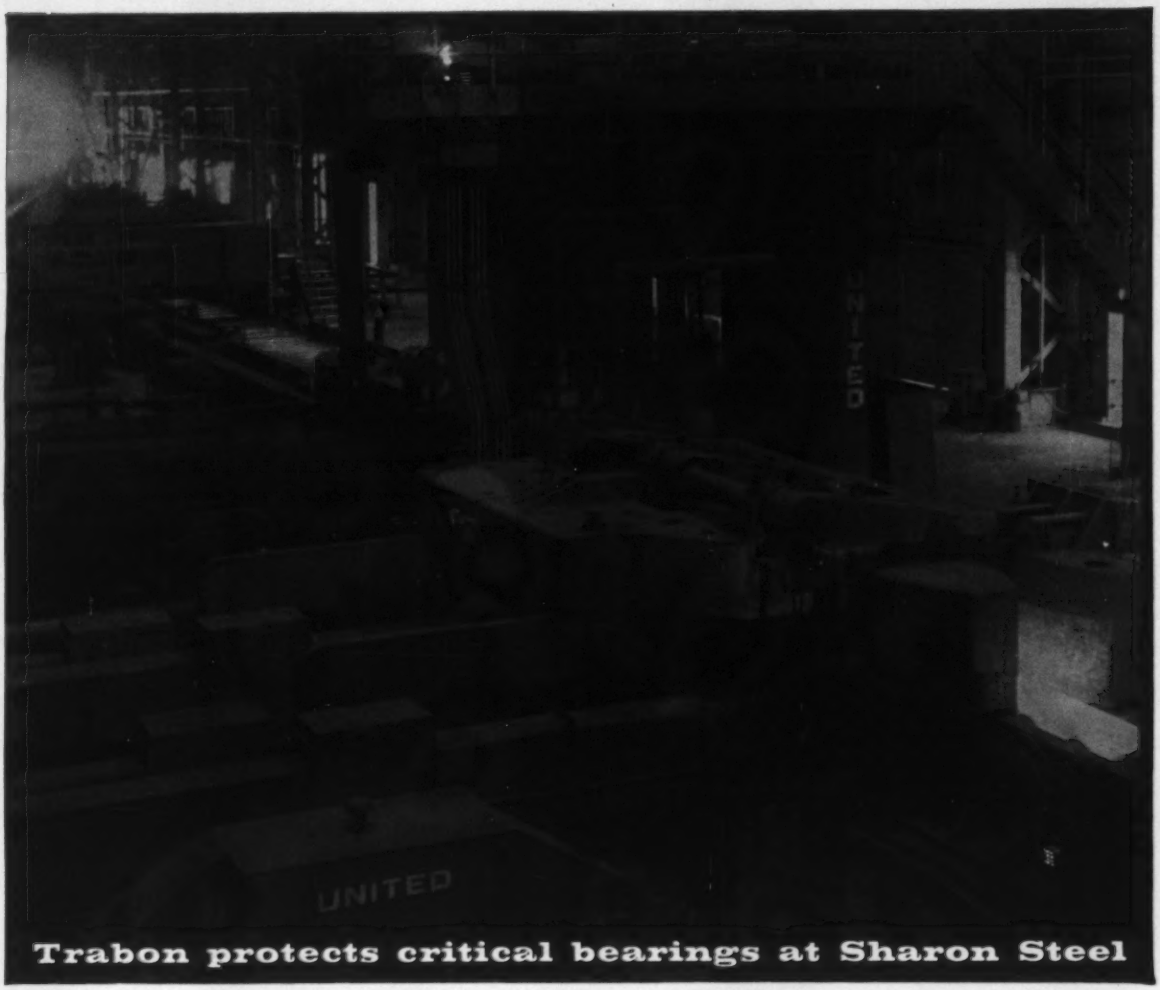

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At ease...
with a lot of tension

This man is strapping coils of steel with a Signode air-powered PN tool that takes 1¼" strapping directly from the dispenser. No waste strap. There is plenty of tension at his fingertips—up to 1600 pounds at 90 p.s.i. Action of the PN is fast, easy, powerful, dependable. Seals are applied quickly and positively with the air-powered N1435 tool at left. The portable Model DM1 tool stand and dispenser shown in the foreground saves additional time and effort.

This combination of tools and accessories, widely used in steel mills, is just one example of Signode's capability and interest in helping make your product cost less to package, handle, and ship. For more information, write for free copy of "Air Power Tensioners and Sealers."

First in steel strapping

SIGNODE STEEL STRAPPING CO.

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